PEED IS MY HOBBY by FRANK FULLER, Jr.

POPULAR AVIATION

MARCH 25

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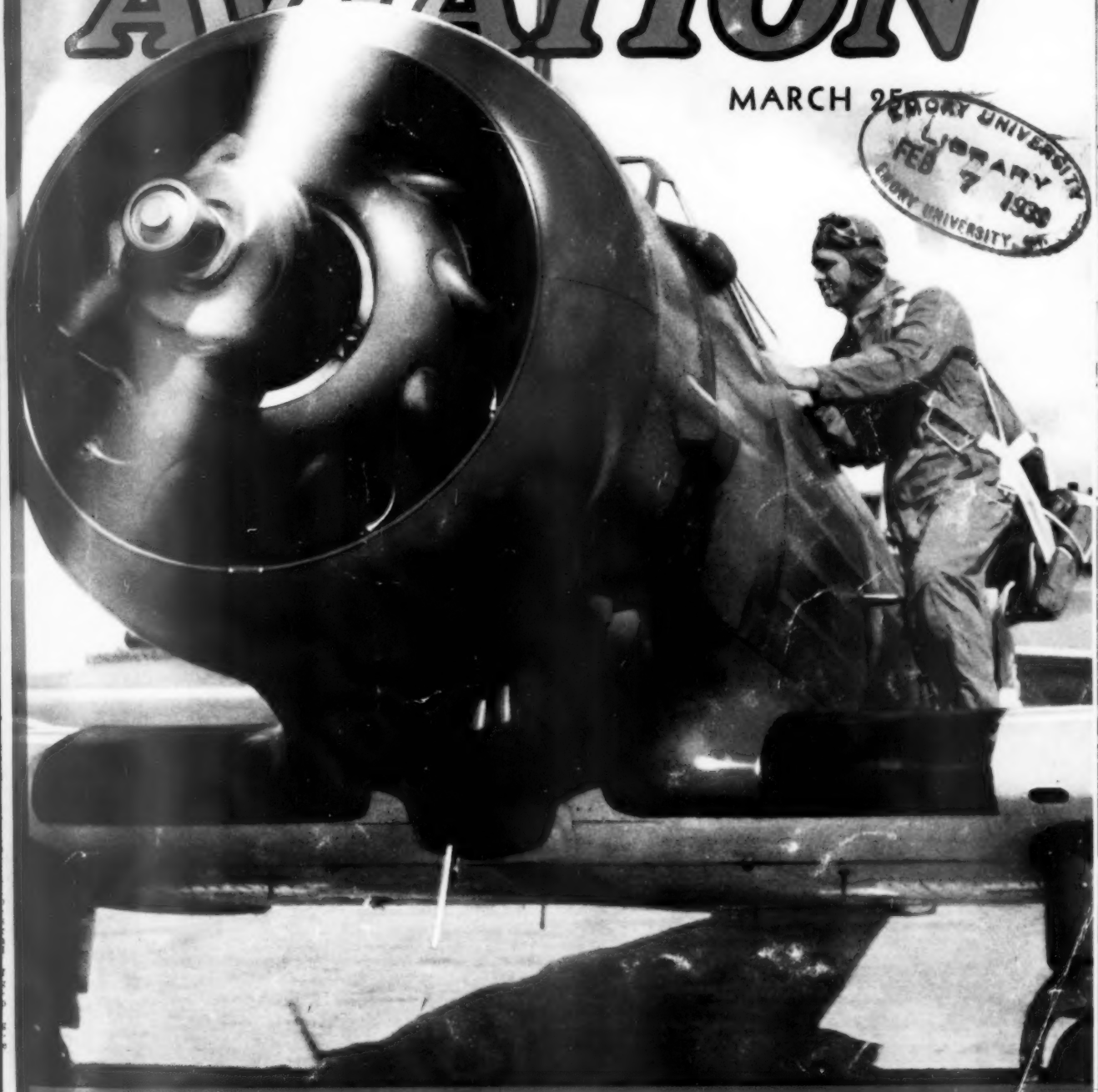

EROBATICS ARE INSURANCE by TEX RANKIN

FLYING MARINES

HE CASE FOR THE DIVE-BOMBER by FRANK TINKER, Jr.

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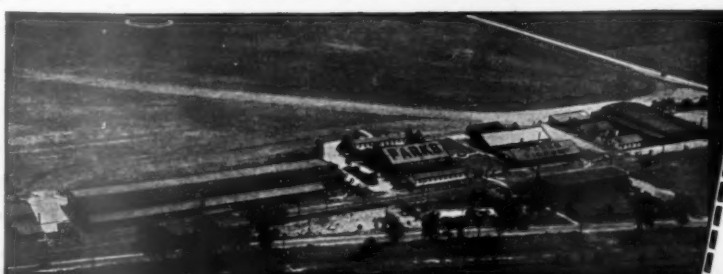

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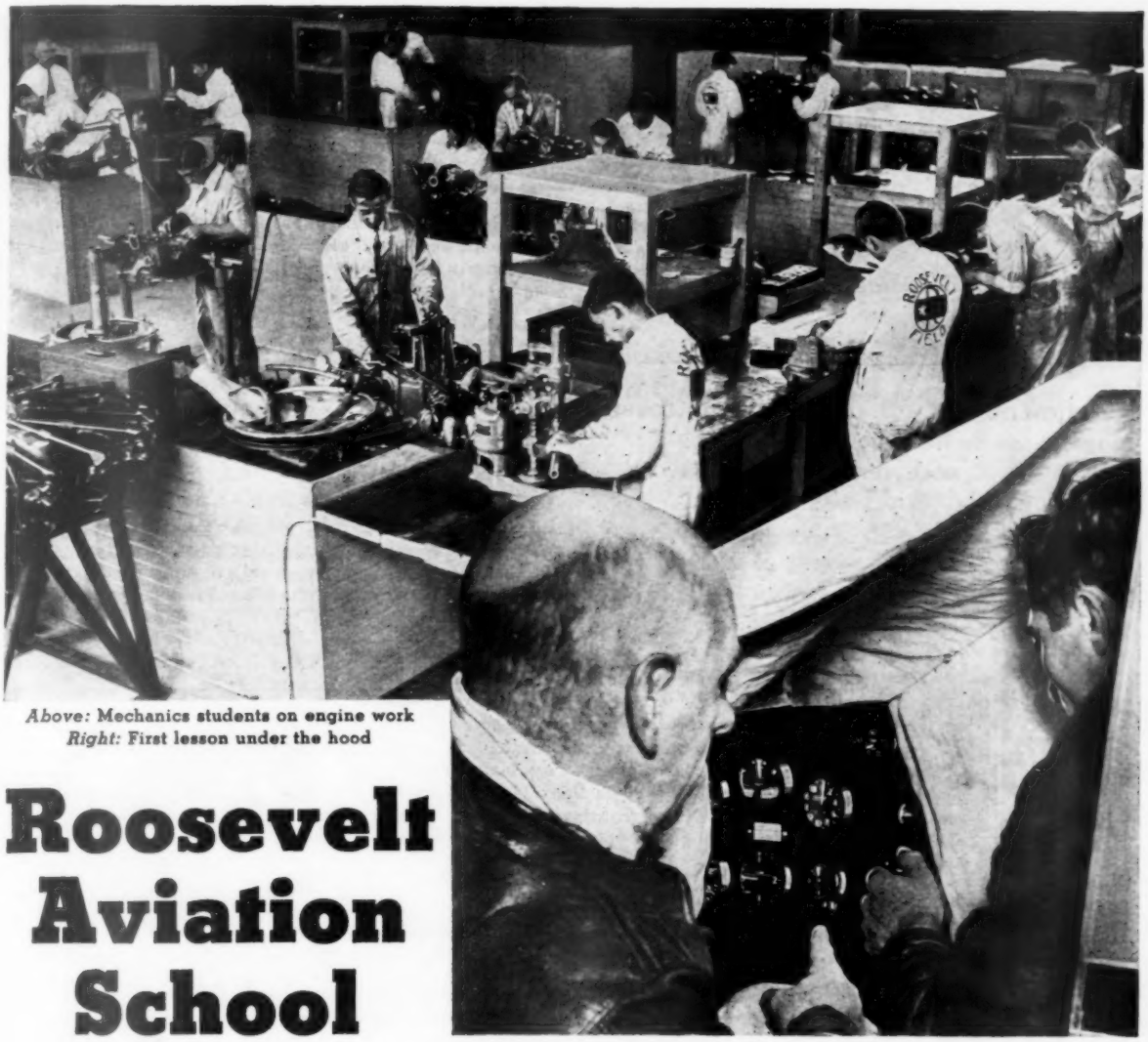

Above: Mechanics students on engine work
Right: First lesson under the hood

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advises every young man who is interested in a career in aviation *to start training for that career today.* It is not necessary to tell you that at no time in the history of aviation have *opportunities for properly trained men been so numerous and so great.* You know that all this *increased activity* in aviation is going to *create the need* for more pilots, mechanics, airport employees, designers and executives *than are now available.* You also know that the *prerequisite for any position in aviation is proper training.* You *know* that the untrained man hasn't a chance. So, if you are *seriously* interested in a career in aviation, you are going to do *one* of *two* things: You are going to *start your training now and you're going to learn, work and win*—or, you are going to *wish* that you had. YOU ALONE CAN MAKE THE DECISION. MAKE IT NOW. MAIL THE COUPON TODAY.

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P. A. MARCH, 1939

The Birdmen's Perch

Next to the Whopper Club, the most popular feature of the Perch is the Problem Dept. Every month, more and more answers (some right . . . some wrong) come in to be corrected. This month we're getting away from mathematics for a trial hop in plain and simple visualization. Let's hear how you like it.

MAJOR AL WILLIAMS, alias "Tattered Wing-Tips,"
Mgr. Gulf Aviation Products, Gulf Bldg., Pittsburgh, Pa.

AVIATION QUIZ

Can you identify the five following titles?

1. "The Winged Sword of France"
2. "The Black Eagle"
3. "The Red Knight of Germany"
4. "The Flying Scot"
5. "The Balloon Buster"

(T. W. T. has the correct answers, fellas. Send in yours and he'll red pencil 'em for you.

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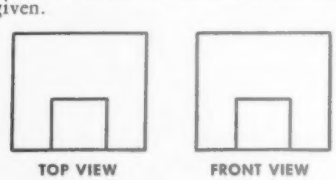
A MATTER OF PERSPECTIVE

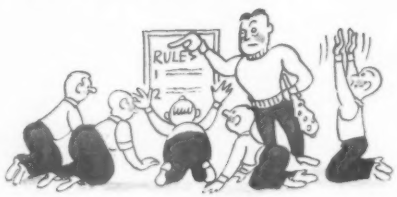
Here's a problem sent us by Ralph B. Oakley of Inglewood, Calif., who says it's a part of a test given by airplane factories to prospective employees. The object is to draw the third or side view of an object when the top and front views are given.



TOP VIEW FRONT VIEW

Mail your sketch to T.W.T. and we'll send back the official rendering of what the darn thing looks like. We warn you . . . you'll be plenty surprised.

CLUB CORRESPONDENCE

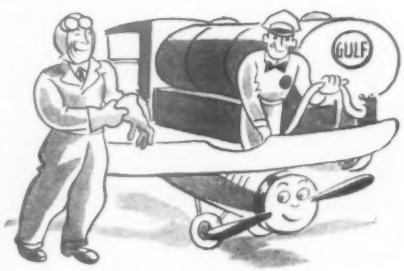


We have a note from Fred Scace who is president of the Berkshire Airmen's Club, Inc., in Pittsfield, Mass. The boys up that way evidently have a very successful organization and Fred offers to try to answer any other club officer's special problems if you'll write him direct. Generally speaking he says that there are two main grief-saving rules to observe from the beginning:

1. *Don't try to operate on too close a budget the first year.*
2. *Adhere strictly to C. A. A. regulations.*

We second both motions. And, because we have a lot of faith and interest in the contribution club flying is making to aviation, we hereby throw open the columns of the Perch to any worth-while slants or wrinkles our readers may contribute.

THIS MONTH'S WHOPPER



Dear Major:

Bright and early one morning I took my flying flea out for an altitude test. Thought I'd try 'er out with a little of this Gulf Aviation Gas I hear so much about. Gave 'er about five gallons.

Well, sir, she jumped clean over her chocks and up we shot! 10,000, 15,000 . . . 20,000, 30,000 . . . 50,000! I was taking on altitude at such speed that the sparks from my exhaust caught the tail of my flea on fire!

Right then the altimeter broke at 68,000, a new world's record! But it was so cold that the flame froze stiff as a board! Still I wasn't takin' no chances. I took 'er down and wheeled 'er into the hangar. But the change in altitude musta' made me forget about the fire.

A few seconds later a grease monkey came rushing over screaming like an Indian. "Hey, look at your flea, Captain!"

Sure enough. The flame has thawed out and there's my poor flying flea gyrating all over creation beating its tail on the ground to put out the fire!

Capt. E. Norman Dambacher

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Time to Complete, 30 weeks.

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Time to Complete, 48 weeks.

Combined De Luxe Private Pilot and Master Mechanics Course
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Aircraft Radio Service and Repair Course
Time to Complete, 24 weeks.

Combined Aircraft Instruments and Radio Service and Repair Courses
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WITH all this war talk and banner waving going on, we can't help but note that all of our largest airplane factories are still located on the coast, exposed to enemy operations in every direction. Just one little trip along the coast by an enemy bomber and that will permanently end our aerial program in that war.

* * *

THEN there is another topic for conjecture. Most of the wagon builders have disappeared and the piano factories are not what they were in years gone past, so where will we look for the aircraft production facilities that so charmingly were blockaded in the last war?

* * *

WE remember the wild scurrying and upheaval that took place in '17 and our experience at that time with the various aircraft boards and dollar-a-year officials that headed them. Even at that price they were grossly overpaid and were the main contributory factors in our zero military aircraft production. I wonder whether it will be necessary for us to buy or borrow ships from our allies in the next scrap?

* * *

AS you no doubt remember, our aces did their acing in Spads, Nieuports, and Camels—not in American built aircraft although we had the facilities for turning out ten times the number of ships required were those facilities handled intelligently. Are we again going to have, as the heads of our aircraft production, automobile magnates, petroleum magnates, liverwurst magnates and all the rest of the crew that nearly licked us the last time?

* * *

THIS sort of thing is an old story in this country, dating back from George Washington and Valley Forge. It was the same sort of condition that prompted Admiral Dewey to cut communication between his fleet in Manila Bay and the hostile fleet in Washington, D. C. We hope, pray and trust that the higher-ups in the next war will actually know some-

(*Continued on page* 89)

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Cover Photograph taken at Randolph Field by Ivan Dmitri

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THEY DIDN'T "MISS THE BOAT"

These young men, shown above, are all recent graduates of Curtiss-Wright Tech. They are here shown sailing for Europe. THE DAY THEY GRADUATED from Curtiss-Wright Tech they received a contract for one year at a splendid salary from a prominent European aircraft concern. This is only one of the many hundreds of similar examples, showing why Curtiss-Wright Tech training ALWAYS pays. Mr. Donald Douglas, President of the Douglas Aircraft Co., Santa Monica, California, says, in a letter to Major C. C. Moseley: ". . . During the past several years, we have employed a large number of your graduates and have found them to be eminently satisfactory. Efficient workmen capable of working with the care and precision demanded by the Douglas Aircraft Company are the product of thorough training and are difficult to find. You are to be congratulated on the fine job your Institute is doing in turning out such men. . . ." No higher compliment can be paid Curtiss-Wright Tech and its graduates—nor is there any higher authority than Mr. Douglas. Curtiss-Wright Tech is approved by the Civil Aeronautics Authority, Accredited by the State Board of Education, Endorsed by the Aircraft Industry and offers specialized practical training for your career in AERONAUTICAL ENGINEERING or MASTER MECHANICS. In the heart of the Aircraft Industry. The only Civil Aeronautics Authority approved school of its kind in Los Angeles County. No flying involved. Approved by the U. S. Department of Immigration for non-quota foreign students.

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Frank Fuller, Jr.

Speed IS MY HOBBY

by FRANK FULLER, Jr.
as told to Don Wiley

When an ordinary business man takes up air racing for the fun of it and sets a few enviable records to boot, he's definitely a gentleman worth meeting.

Below is Dr. W. R. Lovelace and his novel oxygen mask which the author has used.

IT gets into your blood, this cross-country air racing.

It has been in mine since the winter of 1932-33 when I first felt the itch to compete in the Bendix Trophy dash, greatest of all cross-country races. And the fact that I won that race in 1937 and placed second in 1938 hasn't cured me by a long shot.

I'm supposed to be an average sort of Amercian business man. But better than anything else I enjoy sitting for hours, humped up in the cockpit of my silver Seversky, sucking oxygen out of a tank instead of breathing normally, deafened by the roar of the big twin-row *Wasp* out ahead of me, rocketing through space at close to 300 m.p.h. while the world down below is rolling along at less than 50.

When my friends ask me why, I can truthfully reply: "Well, there's a whale of a lot of satisfaction in knowing you're traveling from one place to another faster than anyone has ever traveled before."

The Seversky and I already hold seven inter-city speed records and by the time this is published we hope to have established quite a few more through a series of flights to the capitals of the 11 western states on behalf of the Golden Gate International Exposition with which I am associated as "flying ambassador".

But aside from the sheer personal satisfaction of setting new speed records, there is a more serious side to my devotion to cross-country racing I believe it makes a definite contribution to the advancement of aviation—far more, for instance, than closed-course racing. The latter provides a terrific proving ground for planes and engines but little else, whereas cross-country racing is encouraging research into high-altitude flying, increasing instrument technique and teaching us a great deal about motor performance under conditions which parallel those found in actual air transport operation.

That statement will bear with some elaboration a little later on. Right now I'd like to talk about the urge that sends people like myself into aviation.

I learned to fly in Honolulu, of all places. That was back in February, 1927, the year of the Lindbergh, Byrd, Chamberlain, and Dole flights. Bound for the Islands on a business trip I picked up a magazine aboard ship, ran across an article by Rex Beach in which he described a flight during which a pilot let him take the controls after the ship was in the air.

The idea intrigued me, for Beach had made it all sound very simple and at the same time thrilling. The more I thought about it the more I liked it. And so, when I reached Honolulu I made some inquiries among friends. They told me a pilot named Harvey Lemke, recently retired from the Navy, had started an air service down Waikiki Beach way. One day I drove out to see Harvey and broached the idea. He was willing and once we were well above the ground he signalled for me to take over. The aviation bug had claimed another victim!

Harvey must have been a pretty good salesman, for by the time we'd landed

Above is the author's takeoff from San Francisco for Seattle recently. He established a new inter-city record.

again (with Harvey at the controls) he'd sold me on the idea that I was just naturally cut out to be a pilot. He was such a good salesman, in fact, that he is with my uncle today, as pilot of his twin-engined Lockheed.

Shortly after the first experience in the air I was taking instruction from Harvey. After 20 hours I took my test for my license—the first commercial license issued in Honolulu.

In the fall of 1927 I got my first plane, a Travelair. Then in 1931 I enrolled in the Boeing School at Oakland Airport where I trained for a transport (now commercial) license No. 732, and later secured a non-scheduled instrument rating.

As I've said, the Bendix race began to intrigue me late in 1932 but it wasn't for four years that that idea became a reality. It was in the back of my mind, though, and when in the fall of 1936 I read that Seversky had won the Army pursuit ship competition with the fastest plane of that type ever built in America, I was definitely interested.

What I wanted, I decided, was a proven plane—not an experimental job, but one which had a high performance and safety rating—in fact, the sort of a job the Army would approve. And so I journeyed back to Long Island and talked things over with Major Alexander P. de Seversky. Would it be possible to buy a modified type of the Seversky pursuit? It would, and shortly we were poring over blueprints, with a result that I placed an order for my present ship.

It was the first of its type ever built for a civilian and special permission had to be obtained from the War Department. Maj. Jimmy Doolittle ordered one just like it and received delivery of his ship two weeks after mine was finished.

As it finally developed, the plane didn't differ radically from the military job. We cut down the windshield and cockpit hatch cover a bit, as the wide visibility so desirable in a fighting plane wasn't necessary in a private job. And without armament it was possible to provide for tanks for 150 additional gallons of gas in the outer wing panels, giving the plane a total gasoline capacity of 350 gallons. But that was about all.

I returned to Farmingdale the following spring to look the ship over. In August, it was ready. I took two hours of dual control at the factory, then headed west. And it didn't take long to discover the Seversky was a sweet ship, not too difficult to handle and responding to the controls beautifully.

The story of the 1937 Bendix race is an old one now, although it will always give me a thrill to know that I set a new Bendix Race record for both the Los Angeles-Cleveland and the Los Angeles-New York flights. But I would like to dwell at more length on my ideas of what can be gained by this type of racing.

Let's consider, for instance, the resultant encouragement for instrument flying and the use of navigational aids. In the Bendix you don't fly the regular airways if weather conditions are anywhere near normal. You go just as straight across country as you can and you naturally have to depend upon your instruments and your knowledge of avigation.

(*Continued on page* 80)

Currently, the author is "flying ambassador" for the San Francisco World's Fair.

HERE COMES A WHIRLIGIG!

by DONALD FROST

There is much to be said for the future of the rotorplane, gyroplane, helicopter or autogiro—whatever you wish to call it. We present the facts of the case to date.

Uncle Sam's Army Air Corps is looking into the future of the rotary winged aircraft too. These are Kellett autogiros now used by the Army.

THE Wright Brothers—so the story goes—first became interested in flight by watching a whirligig.

A whirligig cut on a larger pattern, embodying principles proposed by the immortal Leonardo da Vinci more than 400 years ago, may give wings to hundreds of thousands who otherwise never would fly.

We say "may" advisedly, because the wishful thinkers have been predicting for the last decade that everyone would fly this year, or next year, in a machine supported by a whirling canopy of blades which looked like a windmill on the loose.

Based on the opinions of several outstanding research engineers—and not on the dreams of Jules Verne enthusiasts—the conclusion can be drawn now that prospects for the spread of "windmill" flying are beginning to brighten.

Moreover, one of the world's leading designers says that helicopter flight, which is a step beyond autogiro flight, presently will cause tiny landing fields to mushroom up by the thousands throughout the nation to accommodate the machines of you and your neighbors.

This is the British Hafner gyroplane, a successful design that shows much promise.

He is quick to add that rotating-wing craft will never successfully storm the province of the conventional airplane at any time.

In keeping faith with its readers, POPULAR AVIATION must add on its part that the proof of the pudding is the taste. The current *possibilities* are that if you are just entering the 'teen age, you will be able to purchase a rotating-wing craft by the time you cast your first ballot; if you are 60, you can be popping around the countryside in the same thing before you have reached your allotted four-score-and-ten.

Two ruling factors are involved: mechanical perfection and price. Price will depend on mass acceptance. Anyone who studies the history of the automobile will understand why over-the-counter purchases of windmill machines cannot be made possible overnight.

The autogiro, or gyroplane, is an accomplished fact. A hybrid—part conventional airplane and part helicopter—it flies, but it is notably less efficient for a given amount of power than the standard plane. Because power is not applied to the blades or the blade mounting, it has little trouble with one thing which has stalled helicopter development in the past—torque effect.

I have heard it said by gyroplane pilots that the machine is harder to fly than an ordinary airplane. It develops vices in certain attitudes and speeds which a fixed-wing machine would not.

It naturally follows that to call lightplanes less safe than rotating-wing craft is to beg the question.

But in pursuing their goal, the rotating-wing enthusiasts stress the virtue of direct (or near-direct) descent and—

in the case of the helicopter designers—of vertical take-off.

As a representative of POPULAR AVIATION, I sat through the sessions of the first international rotating wing aircraft conference in Philadelphia late in October. Early in November, I had the unique opportunity of talking with Raoul Hafner, of England, who has been called the outstanding "windmill plane" engineer of the world.

"Is it coming?" I asked Hafner.

"Yes," he replied. "Rotating wing flight is coming. We shall take off straight up, land straight down, and the mechanics of the whole thing is going to be simplicity itself."

Around a luncheon table Dr. George Lewis, perhaps the world's leading aeronautical research expert and the man at the helm of the National Advisory Committee for Aeronautics, had said that the NACA laboratories at Langley Field, Virginia, had increased the efficiency of "windmill" blades by 60 per cent in six years.

The conversation during a dinner preceding the conference turned on George de Bothezat's helicopter evperiments at what is now Wright Field, Dayton, Ohio, in 1922-23.

De Bothezat, a brilliant Russian engineer who once called Alexander Klemin, chairman of New York University's Guggenheim School of Aeronautics, "stupid, like all the rest of you American aeronautical people," was building the first helicopter ever attempted on a grandiose scale in this country.

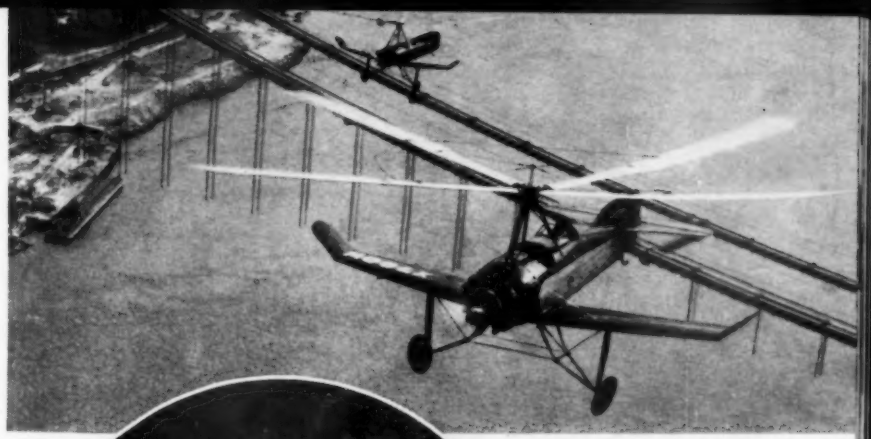
It "flew," eventually, rising a few feet off the ground. But Army fliers stationed at the post sent de Bothezat into Donald Duck rages by peeping at his work. De Bothezat had erected a canvas wall around his contrivance to insure secrecy. Army flyers are a breed consumed by curiosity. Whenever the opportunity offered, they flew over the spot where the Russian was working and had a look-see.

His magnificent displays of indignation drew from the commanding officer of the post the dubiously satisfying reply that the pilots would be warned to respect the privacy of science. They never were.

De Bothezat now is constructing a helicopter which he hopes will be the answer to vertical flight. His workshop, in a shabby little building under the "El" structure in Long Island City, N. Y., hard by the oily East River, is under lock and key so far as the public is concerned.

The fact that two of Igor Sikorsky's most valued employees, an engineer and a test pilot, have thrown their lot with the eccentric Russian, lends credence to the belief that he has something. Just what, remains to be seen. He has solved his torque problem with the standard method of opposed thrusts.

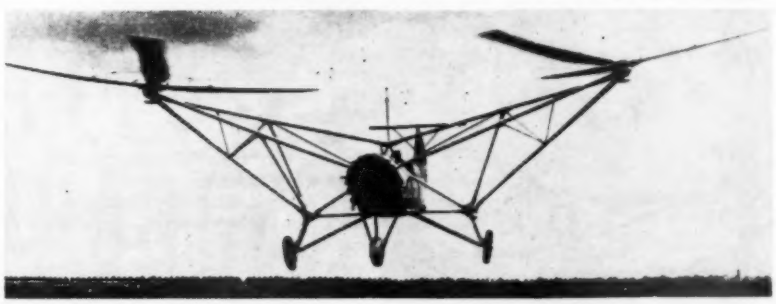
At the conference proper Raoul Hafner, of course, contributed an explanation of the operation of his newest gyroplane. In the presence of Agnew E.



The first successful American 'giros (above) were built by Harold Pitcairn.

A later (and lighter) Pitcairn model was that at left, now a forestry ship.

The Focke-Wulf helicopter below has startled world airmen with its performance.



This British Cierva 'giro is the latest of its kind. It landed behind that rope.

The U. S. Marines bought this Pitcairn for experimental aerial observation work.

Still experimental is the Pitcairn "roadable" 'giro that can be driven on highways.

A few years ago Breguet, famed French designer, built this fairly good helicopter.

This Kellett wingless model landed on the Chicago post office and took off with mail.

Larsen, resourceful chief engineer of the Autogiro Company of America, and of Wallace Kellett, the manufacturer who has been supplying the Army Air Corps with autogiros, one research scientist remarked that Hafner was two years ahead of the rest of the world in rotating wing flight. Agreement on that point seemed to be general.

The multitudinous problems of windmill flight were presented. And they were as prickly as the thorns on an Arizona cactus. The hullabaloo accorded the Cierva autogiro when it was brought to the United States a decade ago gradually dissolved in the realization that the machine which caused the late Thomas A. Edison to exclaim, "That's the answer!" was far from perfect. It went out of control at low speeds. What engineers know as yawing moments presented bad difficulties. Resonant vibration once almost cost the lives of two Pitcairn engineers.

But Harold F. Pitcairn, the Willow Grove, Pa., multimillionaire whose fortune was founded in the plate glass business, fought the battle through. Today the quiet-spoken Larsen, Pitcairn's chief engineer, has a new "roadable" autogiro —devoid of "bugs"—almost ready for presentation to the public. The rumor is that the effort has cost Pitcairn no less than $3,000,000.

The Philadelphia conference closed in agreement that windmill flight is coming but still must battle the inertia of public indifference. The forward strides of Focke in Germany, and of Breguet in France, were appraised. Focke, of course, by far has been the most successful helicopter inventor since the birth of man-made flight.

In Cleveland, during the National Air Races, that diminutive little flyer, Hanna Reitsch, who charmed a table of 20 men into silence with her quick, child-like smile, told me: "The Focke? I poosh a lever, yes? I pull, no? I fly."

The Focke has done 100 m.p.h., yet hovers at ease above the heads of thousands of spectators in a closed auditorium.

Now we shall talk with Hafner. He is 33, was born in Vienna, and obtained his technical education in that city of gay women and old wines. Before he could use a razor legitimately he had begun experiencing the thrill of sailplaning.

"The usual story," he explained. "I came out of school, went into industry, did a spell at airline work, and finally began designing airplanes."

Fixed-wing machines, he concluded, were perfectly all right in their sphere—which was large and growing—but rotating wing flight intrigued him.

"It seemed to me," he said, "that windmill flight deserved investigation."

No one would disparage Hafner's initial efforts at building a helicopter more quickly than the engineer himself. He made one in Vienna, and started another which he finished in England. Neither could be catalogued as brilliantly successful.

"I realized," went on Hafner, "that the trouble with helicopter experiments was that nobody had sufficient knowledge of the problems involved to really do an honest job. So I started in with pencil and paper and a wind tunnel."

Juan de la Cierva, the Spaniard who was killed in the crash of a transport ship near London in December, 1936, influenced him, of course. Ironically enough, Cierva, pursuing the ideal of safer flight, stumbled on to the answer to helicopter construction without knowing it. Though patents for revolving wings with universal joint roots had been taken out in 1909 and again in 1912, Cierva actually was the first to use the principle—in an autogiro.

His chief problem, Hafner concluded, was the operation of his rotor. The question of co-axial rotors, of turning moments, and of torque could wait until he got that windmill to the point where it would sit up and bark when he commanded it to.

So he turned to the construction of gyroplanes, which is only another name for our more familiar autogiro. Like Larsen, of the Pitcairn organization, Hafner devised a tiltable rotor. That insured complete control, even in a stall, when the machine sank toward the earth vertically.

Hafner's rotor differed from Larsen's. Instead of tilting the entire head and supporting structure on which his blades were mounted, Hafner tilted only a collar-like mechanism, thereby preventing gyroscopic effects from transmitting themselves to the machine's fuselage.

By a series of levers, he managed to obtain constant control of his blade pitch. That enabled him to take-off at an angle

(*Continued on page 72*)

The author does this kind of flying for the movies. It's not as crazy as it looks.

Mr. Rankin is "world champion stunt pilot". He is shown below holding that trophy.

AEROBATICS ARE INSURANCE

by TEX RANKIN

as told to Edward Churchill

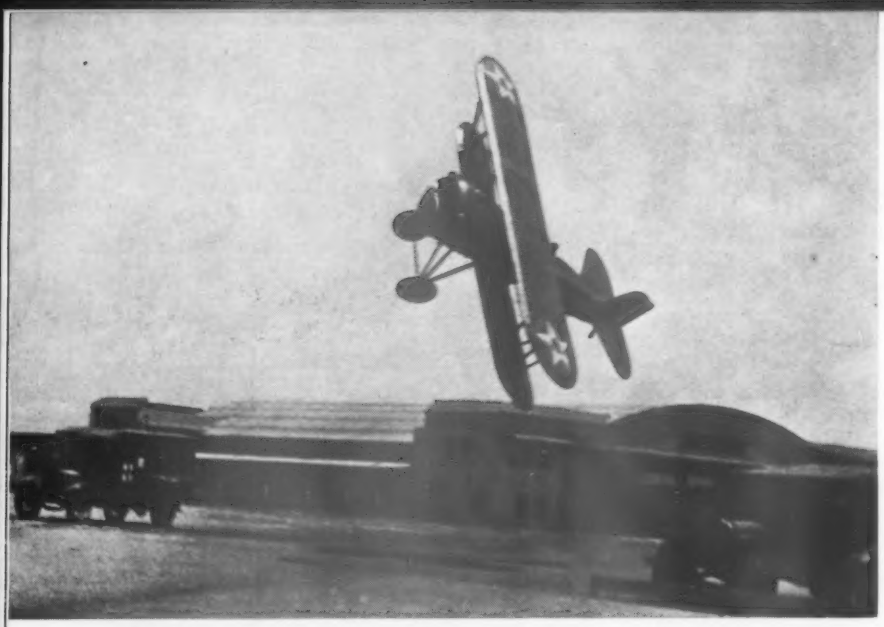
Here is another of Mr. Rankin's valuable articles. Inexperienced pilots will do well to heed his advice.

ONE minute my photographer and I—we had been doing some mapping near Marshfield, Oregon—were flying right side up. We had 600 feet. The terrain beneath was rough and uninviting. High mountains of the Coast Range towered above us.

The next minute with a mighty blast of turbulent wind the storm suddenly broke upon us, throwing my ship upside down.

If I had pulled the stick back, as in coming out of a loop, I would have dived right into the ground. I didn't have enough altitude to allow for such a maneuver. Instinctively I pushed the stick slightly ahead and to one side, leveling off upside down and then doing half of a slow roll to right myself. This long-studied and often used aerobatic maneuver saved our lives. In other words, all the aerobatic practice I had ever done paid a dividend in that emergency.

If we were cats and had nine lives, it wouldn't be necessary to work so hard at aerobatics. We could toss away a life here and there while meeting



This kind of flying looks extremely dangerous. Actually, an experienced stunt pilot has plotted out every move he will make. Such flying is done largely for the movies.

an aerial emergency. But unfortunately we haven't nine lives, so it's a very good idea to preserve the one we have with every precaution possible.

That minute of emergency flying is one answer to all who ask why today's pilot should know anything about aerobatics. Frankly, at the age of 45, after flying 22 years, I have more confidence in my ability than ever before because I know that no matter what position my airplane may get itself into, I can control it.

It's a great consolation to know that if the engine quits I can land the ship without injuring my passengers or myself. That if there is any cleared space into which I can land I'll probably not even damage the airplane. To know to what extent I can sideslip, know by the feel of my controls how much I can fishtail to kill speed, how much I can pull up the nose of my ship and pancake without stalling and dropping in.

I hope the reader will not get the impression that flying is so dangerous all pilots must be professional aerobats to avoid injury. I'm trying to avoid this. What I am trying to tell you is that I consider it advisable for all pilots to have some knowledge of aerobatic flying as added insurance against death or injury in an emergency arising under *unusual* conditions.

A long time ago, in my old home town of Brenham, Texas, I had a teacher in psychology. I didn't understand many of the things he told the class. But one statement he made has always stuck in my mind. It is:

"Many things in life are mental hazards. We are afraid of what we don't understand."

The truth of this has been borne out so many times in my life. Personally, I'm afraid of a great many things I don't understand. That man up on the high tension pole fixing those wires frightens me. I know that a lot of people have been killed touching live wires. I wouldn't go near that fellow or try to do his job. A chemist goes into a laboratory and starts mixing chemicals. *I* go in there? No sir! Too many people have been killed by blasts caused by chemicals. Explosive experts wander around with dynamite in their hands, sticking out of their pockets. They drive these sticks into holes they've made. Me go near? Not on your life! To many guys have been killed fooling with that stuff.

Those fellows go close to what I consider danger. I don't understand what they're doing, and I'm afraid. They do understand, and they're not.

The average citizen knows nothing about flying and therefore is instinctively afraid of it because people have been killed. Few laymen stop to realize that the air is an ocean of gaseous fluid and that an airplane swims around in it much the same as a fish swimming around in an ocean of water. And when I started to fly I was no different from anyone else.

I was afraid.

The first few times I went up I was frightened—like most people. I was ashamed to admit it—like most people. And the only reason I was ashamed to admit it was that I was sure I was the only person in the world who was afraid of airplanes. I was positive I wasn't normal. I was equally positive that I never would be able to fly.

But I stuck with it. Eventually I got so that I could fly fairly well. However, there was still that unknown thing—that business I didn't understand—those aerobatics. I approached that stage of my training with a great deal of fear. When the day actually came for me to take my first spins I was wishing I could develop a nice, healthy case of scarlet fever or smallpox so I could crawl into an ambulance instead of an airplane.

Then, as I went to the field, I remembered the line tossed to me by the psychology instructor.

"Many things in life are mental hazards. We are afraid because we don't understand."

I decided then and there that I was going to learn plenty and get the fear of the unknown out of my system—or quit flying entirely, regardless of what my friends might think of me. So I went in for aerobatics. I applied myself diligently. I went so far as to build myself a small model with which I spent hours on the ground figuratively sitting in its tiny cockpit and working out the reaction of an airplane to its controls in every conceivable position. Then I would go high into the air and test the theories I'd developed.

As soon as I learned how to control the airplane in all the different positions, I lost all fear of aerobatics and all fear of every other type of flying. Moreover, I had supreme confidence in my ability to set a ship down anywhere with a dead engine without getting hurt.

I believe I have proved that confidence. During the past 20 years I've had forced landings in ocean surf, rivers, lakes, streets and highways, trees, railroad tracks, low lands, marshes and mountain tops thousands of feet above sea level. Never yet have I ever injured any passenger or myself although I have totally wrecked several ships.

I believe that most of the serious accidents, other than those caused by weather or structural failure, are caused by the pilot becoming panic-stricken. This condition is due solely to fear. The pilot becomes frightened in an emergency because he doesn't understand. The nervous system suddenly becomes violently upset; the mind ceases to function analytically; the pilot is unable to exercise reason and judgement.

A complete understanding of aerobatics and dead stick landings will overcome all fear and panic in an emergency.

Not long ago I had occasion to watch the very slow development of an author and traveler of about 55 years. He had been flying for three years, had accumulated about 200 hours, and the greatest assortment of complexes known to aviation.

"I'm afraid," he confessed, "that I'll climb too fast, that I'll stall, that I'll spin, that my motor'll quit and I won't know how to choose a place to sit down, that my glide'll be too flat—oh, whats the use? I might as well give up!"

My friend sought out an aerobatic instructor. He took ten hours of training. Recently he told me:

"I thought I was the only one who was afraid. I found out that I wasn't. I also found out that once I knew what I was doing, what the plane was doing, and learned the mastery over it, I lost all my fear."

But what of the danger of aerobatics themselves? We can't ignore this question. The public fears them. Young pilots ask why they should risk their necks learning them. Headlines have told a very sordid story about daring pilots who fly anything in any manner at any time. "Pilot Killed Stunting Too Close To Ground," "Plane Falls Apart During Exhibition," "Youths Fall From Ship While Looping," and various other front page announcements have built up

(*Continued on page 74*)

THE ATLANTIC CLIPPER 'UP FRONT'

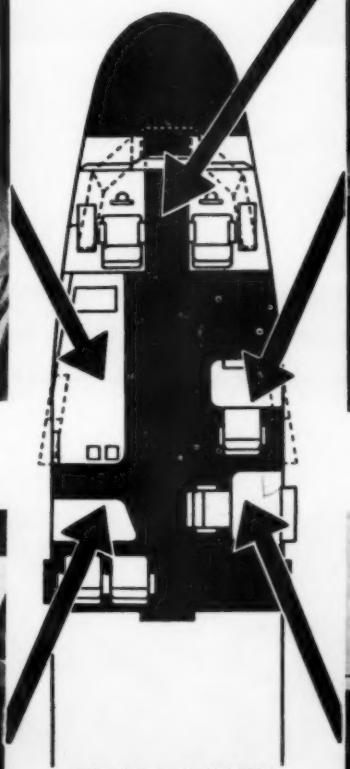
IF the control room of the new Boeing "314" doesn't have some aeronautical gadget, that gadget undoubtedly just isn't worth having. Everything else—and we make no exceptions—has been engineered into this biggest space allotment for a flight crew we've ever seen. The photographs you see on this page are simply the new *Atlantic Clipper's* various stations in the cockpit. Cockpit, we might add, is a misnomer. The control room of the Boeing actually is 30 times larger than a conventional airplane's cockpit. Designed for a flight crew of six, the control room of the new Clipper has a volume of 1,078 cubic feet.

This control room is almost like a spacious living room. The floor is heavily carpeted. All chairs and arm rests are deeply upholstered. Most notable feature of the actual flight controls is the simplicity of the first and second pilots' instrument panel. Just flight instruments have been placed here. The rest have gone either to the radio operator or flight engineer on separate panels. Also, the Clipper's captain now sits at a desk like the captain of an ocean liner.

The two pilots' instrument panel is an extreme of simplicity. The center panel above is the gyro pilot.

This is the navigator's table with a special map case at its right end. The navigator also has a glass "blister" atop the ship to take sights through.

The radio officer has three transmitters and three receivers. Above his head is the control dial of the direction finder.



PLAN VIEW OF THE BOEING '314' BRIDGE

The captain sits at this desk. This picture was made during tests, shows temporary gauges. Note door into wing through which men go to engines.

The flight engineer has 62 indicators to watch, engine and fuel controls to tend. Also note door to engines in right wing.

RUSH ORDER!

The giant XPB2Y-1 as she appeared shortly after her takeoff from San Diego.

by LIEUT.-COMM. ANDREW B. CRINKLEY

as told to Harold Keen

Proving herewith that long cross-country flights with flying boats are neither difficult nor dangerous. The author is an able veteran of many years' service as a Naval air officer.

The author (extreme left) and his crew following the long flight to Washington.

A TELEPHONE jingled one sunny California afternoon in the office of Rear Admiral Charles Blakely, Aircraft Scouting Force commander. From the other end of the wire came the imperative voice of Rear Admiral Arthur B. Cook, chief of the Bureau of Aeronautics, in Washington, D. C.

That long-distance telephone conversation last October 25 started moving, in whirlwind fashion, the incidents climaxed by what has been described as one of the most important aviation feats of the year just passed—the first nonstop west-east and east-west transcontinental crossings by a four-motored Navy airboat in U. S. history.

That conversation conveyed a message which put to the test every element of Naval and commercial aviation, from maintenance and repair to actual flight operation, and the results, as witnessed by one privileged to participate in the undertaking, were highly gratifying to many people, from the President of the United States down.

What Rear Admiral Cook told Rear Admiral Blakely was that the Navy and War Departments had scheduled a review of their most advanced planes at Anacostia and Bolling fields, respectively, the following Saturday (this was Tuesday). A dilemma that appeared almost unsolvable faced the Bureau of Aeronautics, which wished to demon-

strate to the chief executive an example of the largest and most powerful planes of the Navy—the experimental "flying battleships," of which there were only two in existence at the time, the Sikorsky XPBS-1 on the east coast and the Consolidated XPB2Y-1 in San Diego.

At this most inopportune time the Sikorsky plane, which was nearest Washington, was in the factory receiving extensive remodelling to the interior, and could not possibly be prepared in such short order for the presidential inspection. That made it necessary for the XPB2Y-1 to be sent to Anacostia somehow, and by no later than Friday, only 72 hours away.

But, to make matters worse, the west coast bomber also was in the plant for adjustments and in no condition to fly immediately. If ever Naval aviation was "on the spot," it was now. It was a case of fulfilling an assignment with the nation's Number One citizen as an unseen sideline observer, and with possibly the future of the Navy's long-range airboat program hinging on the success of this mission.

Rear Admiral Blakely issued orders to the XPB2Y-1's flight crew to stand by for a secret trip to an undisclosed destination. The factory was notified that the plane must be ready for final tests the following morning. All that night, mechanics swarmed over the bomber, re-installing parts that had been removed. Bright and early Wednesday morning, October 26, the airboat was delivered to us, and with sudden force the realization was brought home that—

Every one of the four 1050 horsepower engines were new, had just been mounted, and had not a minute of flight time to their credit!

I had requested the temporary transfer of Lieut. Clifford E. "Dutch" Duerfeldt from the aviation unit of the battleship *U. S. S. Mississippi* to the XPB2Y-1 particularly for the long jaunt that faced us. Lieutenant Duerfeldt had just completed duty on the trial board which had spent several weeks thoroughly inspecting the plane and would prove invaluable on such a flight, I felt.

"Dutch" came down from San Pedro Wednesday morning, and he, Lieut. E. R. Sanders—my regular co-pilot—and I took the big airboat up for five hours over San Diego harbor to break in the new engines. That was at least equal to the longest uninterrupted period we had kept the bomber aloft since it was delivered to the Navy in December, 1937.

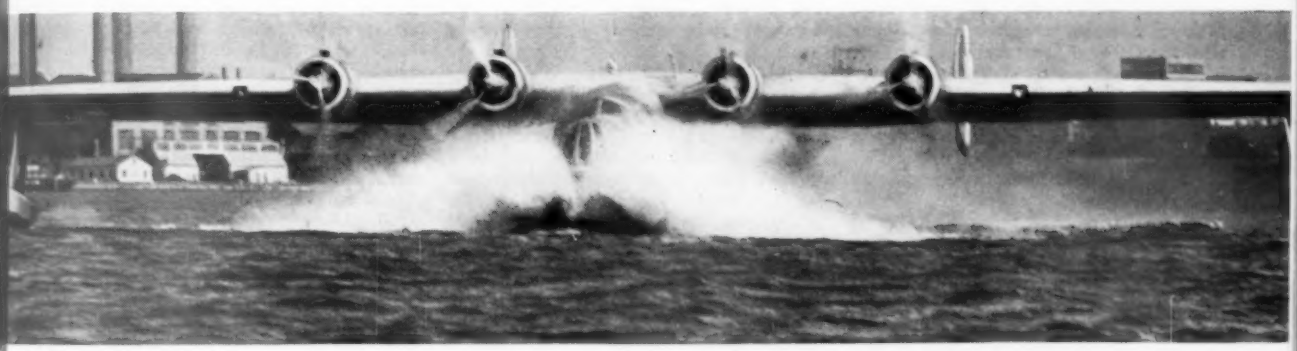
When we landed and announced ourselves as satisfied with the motors, the crew feverishly began stowing aboard every conceivable article we'd need on the trip—from furlined clothing (and were we thankful for that over the Rockies and the frost-bitten midwest plains!) to oxygen tanks and our giant 2,000-pound beaching gear.

All that afternoon we worked at top speed, and not until 10 o'clock Wednesday night, with the take-off scheduled for early the following day, had we finished cramming necessities into the hull, filling the tanks with 3,500 gallons of gasoline, and making a final check on the plane.

And on Thursday morning, October 27, while the rest of the Fleet was preparing to hold "open house" to the general public in the annual celebration of Navy Day, the mighty XPB2Y-1 was cast loose from its moorings and majestically poised for a flight unprece-

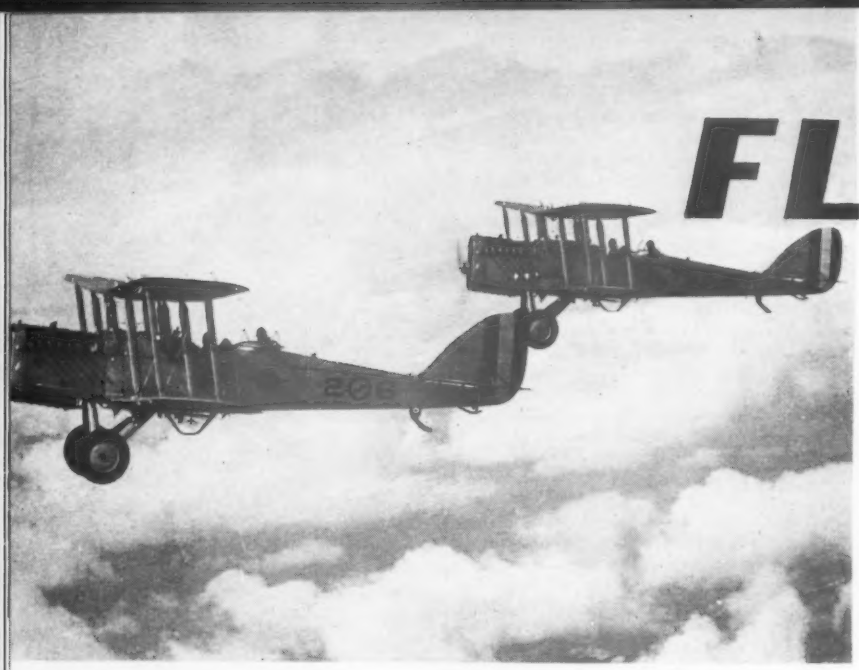
(*Continued on page 82*)

The author, Lieut.-Comm. A. B. Crinkley.



"As we gathered speed for the takeoff, every one of us realized that this was to be a crucial moment of the flight. Would the bomber lift its 56,000 pound load?"

The author discusses the flight and his ship with the President and other officials.



FLYING

by

LT.-COL. C. H. METCALF

★

Uncle Sam's devildogs of the skies have a brilliant record of heroism and daring that makes breath-taking reading.

★

Marine airmen got their start on the same equipment their pioneering brother pilots in the Army and Navy used. Above is an early photograph of Marine Corps DeHavillands.

AFTER more than 150 years of many thrilling experiences on land and at sea, together with occasional wisecracks about "Horse Marines", our leathernecks began to take to the air. The Navy had begun to experiment with heavier-than-air flying machines during 1911; in May of the following year the first Marine—Lieutenant A. A. Cunningham—ever to take to the air, won the designation of Naval aviator. From that time to the outbreak of the World War four additional officers and 30 marines underwent various degrees of aviation training. Among these was Lieutenant Francis T. Evans who dared to defy all theoretical and mathematical theories about flying; by violating the accepted theory he learned to bring a plane out of a tailspin and, for the first time, looped a seaplane. He later received the Distinguished Flying Cross for the contribution he made to the art of flying.

But as soon as the World War came on the little group of Marine aviators began to go places and by the time the Armistice was signed they had expanded to approximately 2,500 men, operating 340 planes of different types, scattered from northern France to the Azores Islands and in different parts of the United States. Since the World War they have had many thrilling experiences in Haiti, Santo Domingo, Nicaragua and China—flying over dangerous jungle country, fighting bandits with machine-guns and bombs and aiding their ground troops. Today, they have two aviation groups, one at Quantico, Virginia, and the other at San Diego, California, both of which are units of the Fleet Marine Force, while many other Marines are undergoing training at various aviation establishments. But let us take a brief survey of how Marine Corps aviation has served its country during the last two decades.

At the time the United States entered the World War the little handful of Marine aviators were in training at the Naval Air Station at Pensacola, Florida. They were soon transferred to Philadelphia and organized into the Marine Aeronautic Company. During the next six months they expanded their organization to 34 officers and 330 enlisted men and trained with landplanes on a field of their own and at Army and Navy training establishments. On October 12, 1917, the company was divided into the First Aviation Squadron and the First Marine Aeronautic Company. The squadron went to Roosevelt, Mineola, L. I., and trained with Army planes until the end of the year when it went first to an Army field at Lake Charles, La., and later moved to a newly established Marine Corps flying field at Miami, Florida. During this period of training the squadron continued to expand and by the end of June, 1918, had 91 officers and 825 Marines. It was again subdivided to form a group headquarters and four squadrons preparatory to being sent to the war zone.

Major Cunningham went to France to study conditions and saw an oppor-

This is Col. Roy S. Geiger as he is today and in his early days with an old 1916 crate.

Lt.-Col. A. A. Cunningham is retired today. Directly above is a picture of him in 1912.

MARINES

Col. Ross E. Rowell today is commanding officer of all aviation in the Marines.

Today the flying leathernecks have the latest equipment available. These Grumman F3F-2 fighters belong to Marine Fighting Squadron Two and are based at San Diego.

tunity for land-based bombing aviation to operate against the troublesome German submarine bases along the English Channel. When he returned to the United States in January, 1918, he recommended that four Marine Corps squadrons operate as a day wing of a proposed Naval bombing group to be stationed in the general vicinity of Calais. The project was eventually approved and preparations were started during May for the Navy to send as many night bombing squadrons as possible and the Marine Corps to send the day bombing units which together made up the "Northern Bombing Group." The Marine squadrons with a total strength of 109 officers and 657 Marines sailed from Miami and arrived at Brest, France, on July 31, 1918.

The Marine Corps and the Navy personnel for the group then moved into the Calais-Dunkirk area and began developing airdromes. Squadron D of the Marine Corps wing and the 88th Company of Marines, equipped with searchlights, reached that area during September. The first planes for the Marine squadrons were not delivered until late in September but, in the meantime, the pilots received advanced training with some nearby pursuit and bombing squadrons of the Royal Flying Corps and with a French squadron. Several Marine officers took part in raids over the German lines as pilots of British planes.

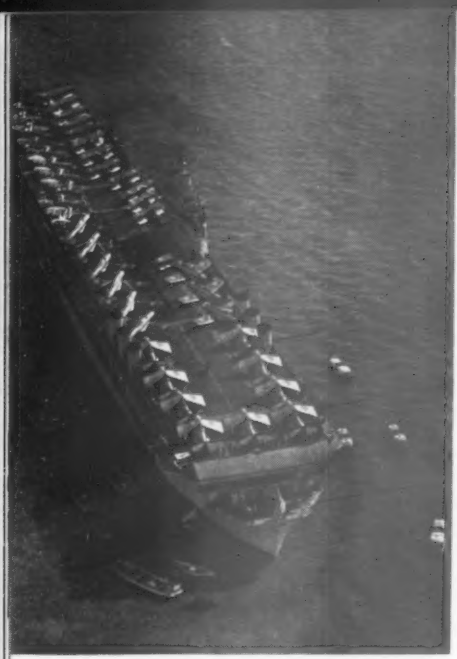
Sufficient planes had been received by early October for the day wing to begin operations with their own equipment. One squadron, acting with a British aviation group, made its first raid (October 13) over the enemy lines. The Marine squadrons made only one raid on the submarine bases before the Germans began a general withdrawal of their line and abandoned their submarine bases along the Belgian coast—the special objectives for the Northern Bombing Group. This complete change in the situation leaving no assigned mission, the group was attached to the American Expeditionary Force. Pershing assigned it to duty with the British army with which it operated until the Armistice. Its mission thereafter was to attack any rear area targets, the bombing of which would hinder the retreat of the German army. The Marine wing carried out several bombing raids behind the German lines.

It was necessary to advance the airdromes to some abandoned German landing fields after the Germans had retreated a considerable distance. This interrupted flights for several days near the close of the war. The Marines managed to carry on several more operations, however, before the end came. They shot down four German planes and one of their own planes was forced to land in Holland. They rendered considerable service to a French battalion—cut off by the Germans for several days—by dropping large quantities of food. After the Armistice the squadrons moved back to their old airdromes and returned to the United States soon afterwards.

If we look for the outstanding hero

The gallant story of Capt. C. F. Schilt (left) is told in the accompanying article. Directly above is Quilali, Nicaragua, from whence Captain Schilt rescued his buddies.

Lt.-Col. Francis T. Evans, another old timer, also is retired.



Versatile Marine airmen are based aboard the U.S.S. Ranger above as well as ashore. Note folding-wing Douglas TBD's on deck.

of the Northern Bombing Group, we find that the honor undoubtedly falls to Lieutenant Ralph Talbot. He was twice engaged in fights with German planes. In one he shot down an enemy, and in both he narrowly escaped death. But a failing motor proved to be his worst enemy. On October 25th he took off with other planes for patrol. His motor began sputtering; he landed but again took off only to be forced to land. Being more than determined to join in the flight, he attempted to take the air again only to crash in a bomb dump and have his ship burst into flames and meet a horrible death. His name has been fittingly commemorated by the naming of a destroyer of the Navy after him in 1936.

But the Marine aviation helped to run another interesting war operation. The Germans had occasionally been able to send submarines far out into and even across the Atlantic during the latter part of 1917. The Allies feared that they might establish a submarine base in the Azores. The British had been guarding those islands but during September, 1917, turned part of the job over to our Navy. Some cruisers and a few submarines, without shore facilities, based at Ponta Dolgado during October. With permission of the Portuguese government, our Navy decided (in December) to establish an advanced shore base, with the necessary supply facilities for ships operating in that vicinity. The Marine Corps was assigned the task of defending the base with aviation and with some medium caliber guns mounted on shore.

The First Marine Aeronautic Company had been transferred to Cape May, New Jersey. It took over the flying field at that place, began training with seaplanes and further expanded its personnel. Early in December it was equipped with seaplanes and flying boats and, under Major F. T. Evans, prepared for duty in the Azores. The aeronautic company, together with a 7-inch gun company of Marines, a Naval contingent and supplies, were transferred to the Azores in January, 1918.

Evans developed an air station and, in about a month after his arrival, began making antisubmarine patrols at varying distances out to sea. The company operated 18 planes and continued patrolling until the close of the war, making as many as 31 scouting flights a week. Aside from the hazards of flying the crude equipment of the time, its experiences were rather uneventful. The Germans by that time were no longer attempting distant operations with their submarines. Neither the aeronautic company nor the 7-inch battery engaged the enemy in combat. One officer lost his life, however, in a wrecked plane at sea soon after the Armistice. The aviation unit returned to the United States in January, 1919, and was demobolized.

Marine Corps aviators, not content with operating heavier than air machines, trained with different types of balloons and formed a balloon company at Quantico in June, 1918. The company operated and trained with heavy artillery units during the remainder of the war but never went to field duty. It also operated two or three seaplanes—the beginning of a permanent aviation establishment at Quantico.

In addition to training most of its officers and some of the enlisted men as pilots, Marine Corps aviation trained 175 aviation cadets during the war. The flying personnel gained invaluable experience which made possible the further successful development of Marine Corps aviation during the following years.

The Marine Corps came out of its experiences in the World War with a few "flying crates"—DH4-B's, "H"-boats, single engine seaplanes, and "Jennys", Curtiss trainers—and a few officers and enlisted men, principally young men who had come into the Corps during the World War, some of whom had had considerable experience in a training capacity or in the war zone. Aviation continued as a more or less separate specialization for marines. The few flying facilities at Quantico were developed into an aviation field that became the Corps' principal aviation center. A smaller aviation field was maintained for a few years at Parris Island, S. C., and a contingent of Marine Corps aviation was assigned to the

Marine airmen evacuated their wounded ground-fellows in the Corps' old tri-motored Fokkers. The above photograph was taken in Nicaragua in 1929, following a battle.

The Curtiss "Jennies" in various stages of assembly below were photographed at the Marine air base at Miami. The date is 1918. Miami was the Marine training center.

Naval aviation station at San Diego, California, in August, 1924. Student aviators were commonly trained as pilots in Marine Corps aviation at the Naval Air Station at Pensacola, Fla. More modern planes were gradually acquired and in 1921 more than a thousand officers and enlisted men were assigned exclusively to aviation duty.

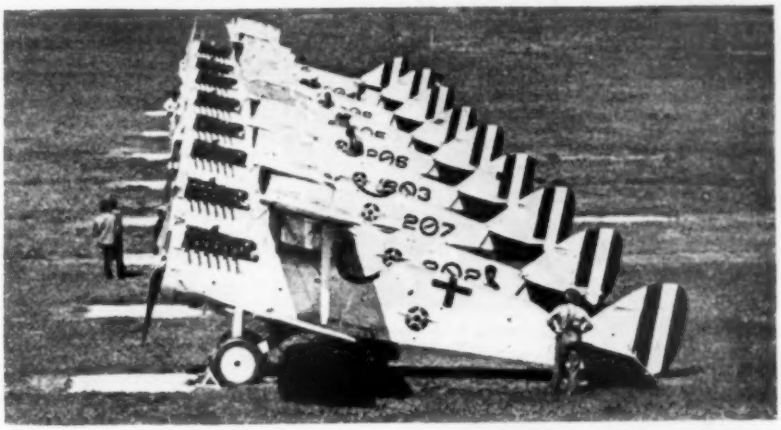
But the years which followed the World War were far too filled with far-flung military operations carried on by the Marine Corps, for its aviators to continue long performing routine peacetime duties. Even before we entered the World War expeditionary forces of Marines had been sent to both Haiti and Santo Domingo, and at the close of the World War they were busily engaged trying to restore peace in those turbulent countries. In both of those countries large groups of bandits were defying the governments which the marines were supporting. A Marine aviation squadron went to Haiti and assisted in carrying on a long drawn out campaign against the Cacos. Another squadron was sent to the Dominican Republic to help carry on the war against the determined bandits of the eastern part of that country. It had its field first on a sugar plantation at Consuelo and later removed to Santo Domingo City (Ciudad Trujillo). In both countries they cooperated with ground patrols, helped to maintain contact and rendered general utility service. They remained in each of those countries for several years.

But it was in the more recent experiences with the brigade of marines in Nicaragua that the marine aviators had their most extensive and exciting experiences. There they not only cooperated with the ground troops, as they had done in the other Latin-American countries, but engaged the bandit groups, under Sandino and other leaders, in a number of thrilling contacts—sometimes fighting as a support for ground troops, at other times vigorously attacking bandit camps, fortified positions or columns of troops with bombs and machine-guns. During the year ending June 30, 1930, the Marine aviators in Nicaragua made 1,275 military flights and a total of nearly 5,000 flights with nearly 6,000 hours in the air. In addition to the combat missions they carried the mail and emergency supplies to the many far-flung stations occupied by Marines and by the native force, the Guardia, officered by Marines. Some of their most thrilling experiences however were in avacuating the wounded.

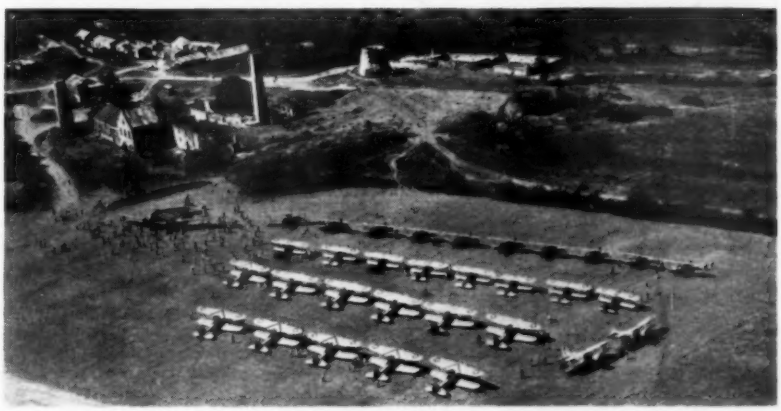
Large Marine patrols were ambushed early in 1928 near the village of Quilali at a distance of more than a hundred miles from hospital facilities. The daring exploits of Lieutenant C. F. Schilt undoubtedly saved the lives of several of the Marines. There was, of course, no landing field in that remote part of the country; by demolishing part of the village they made a short improvised runway—barely long enough for the plane to stop and take off in. In spite of all the difficulties Schilt made a number of trips

(*Continued on page* 81)

Marine airmen never have been limited to any particular types of aircraft. Above is a Corps Loening amphibian on the Cocos River in Nicaragua on a liaison mission.



These Marine Corps DeHavillands were photographed in Haiti in 1924. Note the one ship in the foreground that has been converted into a flying ambulance (with cross).



Above is the Marines' present air base at St. Croix, Virgin Islands. Their equipment in this picture are Great Lakes BG-1's, Boeing F4B-4's and a Douglas DC-2 transport.

The picture below is an excellent example of the makeshift and highly flexible way Marine airmen operate. This portable base is called Bourne Field, is in the Virgin Is.

American Airlines' Ed Bern (rear) got Corrigan to fly AA's route.

This is the story of a comparatively small band of men whose job it is to concoct all those weird things you read about the various airlines from time to time.

TWA's Don Black (above).

Bill Westlake (above) and Clancy Dayhoff (below) are TWA's two other press agents.

RATHER than bury any secrets about this yarn, let it be said, by way of introduction that this is not a story to end all stories but a frank discussion about a comparatively small group of men who hold the strings on practically all information about our domestic airlines that is ever pushed out for public consumption. Some of the Ballyhoo Boys are damned good publicists, some are not so good; some know little and care less about air transportation; at least one is an airline vice-president; at least one is a "Director of Public Relations"; some are "Publicity Directors"; others are "Publicity Representatives" or "News Bureau Chiefs"; but not one calls himself by the honest title of "press agent."

In days gone by only a few airlines went to the expense of hiring press agents. Nearly every prosperous newspaper in the country had an aviation editor—young, vital men who had a sincere interest in promoting the art of flying. They gave up page after page to stimulating use and patronage of aviation. With normal business receding like the setting sun in the early thirties, aviation editors became staff reporters and went into other fields of writing endeavor. The problem of getting free aviation space in the newspapers became a growing one and the need for press agents grew accordingly. Today aviation editors are a rare article—the good ones can be counted on the fingers of one hand. It's safe to say that the entire role of aviation editors—good and bad—is by far outnumbered by the press agentry of the country.

In the field of publicity it is generally conceded that the man who has had experience on both sides of the business can be of the greatest service to his employer. Not everyone subscribes to this school of thought, but generally it is a good theory. Witness the case of Harold Crary, chubby, brainy dean of all airline Ballyhoo Boys. After a brilliant career as a Montana newspaperman (who once got so close to a labor story that he was shot in the leg), Crary was the first man to attempt the formation of an institutional organization for all airlines. His success in civic fields led him to the employ of the Boeing Airplane Company and then he inherited the press agent role for Boeing Air Transport and was sole heir to the publicity throne of United Air Lines when B. A. T. was merged with National Air Transport and other predecessor companies to form the wealthy "Mainline" system. The steps to success have brought fame and gold to him—fame and gold well-earned. He is now vice-president of United Air Lines in charge of traffic. That title is a trifle deceptive to the layman because his counsel, advice and approval are constantly being sought by his publicity and advertising department. Some of the smartest publicity gags and advertising ideas in air transportation have been born in Crary's fertile mind.

Close on Crary's heels from the standpoint of both service and genius is ten-year veteran Clancy Dayhoff, chief of TWA's news bureau. With deftness and verve, Dayhoff prances about the country bolstering the men in his ranks. Much of his time is spent in New York, a seething base for a multitude of publicity outlets. One of the best known of all ex-aviation editors, William Westlake, formerly of the Chicago *Herald & Examiner*, is the TWA bureau chief at

The Ballyhoo Boys

by STEPHEN BATES

LIFE magazine described United's Harold Crary as "a little dumpling of a man."

Chicago. In Los Angeles Don Black, member of the United and Western Air alumni, stems the publicity tide for TWA.

Aristocrat of all the Ballyhoo Boys is William I. Van Dusen. His title is "Director of Public Relations" for Pan American Airways and on his shoulders rests the tremendous responsibility of putting Pan-Air across to the world in a favorable light. Probably no man in airline press agentry has as many friends in the newspaper and allied fields as Van Dusen. When he's not guiding destinies from on high in New York's Chrysler Building, Van is cruising about South America and not infrequently he wings across the Pacific to see that all is in order. Van is perhaps one of three of the Ballyhoo Boys who apply the Ivy Lee meaning of public relations to airline practices. He sees much value in being diplomatic about certain stories, while other members of the ballyhoo tribe would sell their grandmothers out for the sake of a spread in rotogravure. The opposed school of thought to the Van Dusen method are the boys who pay good fees to clipping bureaus, subscribing to clips of not only their own line, but other lines as well. This puts airline publicity on a competitive basis—adding inch for inch to see who came out first for a given month. Sounds silly to a sane business man, but this practice has actually cost a few ballyhoo jobs (good men, too), because the ballyhooer didn't match his competitor's lineage for a given month.

Pan American's Bill Van Dusen.

The latter school of thought has caused a lot of able men to fall by the wayside trying to do the impossible. Fortunately most all of these have profited by sad airline experience and have been able to better themselves. T. Park Hay (TWA alumnus) is now an account executive for an advertising agency; Bill Dunn (American alumnus) is now doing a fine job for the Columbia Broadcasting System; Harris Hull (TWA), now with Sperry Gyroscope; Milton Van Slyke (TWA) returned to the Chicago *Journal of Commerce;* Patricia O'Malley (American) voluntarily gave up the ghost to better herself with the Civil Aeronautics Authority; George Mason (United alumnus), now with the J. Walter Thompson Company (advertising); these are some of the best airline press agents to ever come up the pike, but have graduated along with "Swede" Knowlson of TWA, Charlie Plancke of PCA, Mark Nevils of American and Bill Salathe of Braniff. Nevils, incidentally, has just joined the Curtiss-Wright publicity and advertising force in New York.

Naturally you'd expect some of these ex-airline press agents to be a little bitter about their experiences. Says one, "The airlines have got to fill these expensive airplanes with passengers and every time they are going to hold their public relations man responsible for their failure to do so, because it is his job to sell the idea of flying to the individual; and—unfortunately, through the cheap, chiseling method of free publicity, instead of a straight-forward, constant, effective advertising campaign. They spend more money trying to get something for nothing than they would if they took a few inches every day in the best papers and kept the copy bright enough and attractive enough to appeal to the man-on-the-street—that by using the airlines he would save money. Instead the idea seems to be to get comely young women to pull their dresses up above their knees and have their legs vaccinated in front of an airliner—or

United's Bob Johnson.

TWA's excuse for this picture said "the hostesses ride home on bikes." They don't.

This dog was supposed to meet none but American ships. TWA duplicated with a cat.

have a bathing beauty sit astride the tail and grin for the camera."

Some day, when all airlines reach Pan American's zenith, the life of an airline press agent is going to be a comfortable and responsible one. Unfortunately, the thing that *all* airlines employees claim to know most about is publicity and advertising. Some airline executives are willing to let their publicity men have an honest chance to do an honest job, but most of the Ballyhoo Boys dare not tell all they know because their superiors feel that the public must be regarded as so many infants and treated accordingly. We will have reached Utopia when all the facts are available for the potential air traveler—when the operations of airlines live up to publicity and advertising.

With the introduction of such men as Crary, Dayhoff and Van Dusen into airline publicity, the airlines learned much about the handling of unfavorable publicity. In days gone by, when an airline accident occurred, the first thing that was done was to bar newspapermen and cameramen from the scene, blot out all airline markings and say nothing about causes, etc. Today the airlines recognize that accidents are going to occur and will occur in the future—they happen in all forms of transportation. The airlines try to take every possible precaution to make travel by air as safe as can be. However, when an accident does occur, almost the first thing a press agent does is to notify the press services. A complete passenger list, pictures of the crew (if on hand), details and even probable causes are immediately furnished to the press, with the result that the newspapers respond with moderate treatment of accidents.

During the past four or five years keen competition amongst some of the major airlines has developed an even keener competition amongst the publicity departments. One of the Ballyhoo Boys is always watching the clippings for gags and stunts that have been pulled by his rival the day before, for this reason—should Line A pull a good gag in New York on Monday and Line B hears about it on Tuesday morning—Line B pulls the same gag in Los Angeles on Wednesday morning.

Ed Bern, tall, blustering energetic, publicity chief of American Airlines is probably greatest believer amongst the Ballyhoo Boys that a good press agent need not be an ex-newspaperman. Each day a huge stack of clippings arrives at Bern's office in Chicago. He is a great disciple of the camera and sometimes his office releases as many as 12,000 pictures a month. Bern has never pretended to be a great journalist—in fact his lengthy aviation experience blossomed three or four years ago when he was president of the late Columbia Airlines, which operated over the same route now covered by Marquette Airlines.

Patricia O'Malley, now of the Civil Aeronautics Authority. was one of Bern's best press agent when he assumed command. It was a distinct shock for Bern to lose O'Malley. From her New York office, O'Malley commanded the respect and attention of every newspaperman who came in contact with her. O'Malley was lured away from American by the CAA. To New York from Boston Bern transferred Stewart Faulkner, son of a Cord Corporation biggie, who was given an American publicity job following a session with a Chicago advertising agency. Faulkner topped the entire field (under O'Malley's sage wing) by breaking all kinds of space records during the year or more he was assigned to Boston. His appointment to the New York post was a natural one and he has been doing a fine job for American.

New York competition amongst press agents is keen—Bob Neff of United in New York easily ranks as one of the best three airline press agents in the country. His Yale background and his social standing in New Jersey are coupled with several years of Wall Street Journal experience. He was tempted to take over the New York assignment by Harold Crary after United had had a few unfortunate experiences with Manhattan press agents. Neff has scored an amazing number of triumphs for United—it will be a long while before the other airlines forget the job Neff did for his company in presenting a 12 page spread in LIFE magazine last fall. Neff has two able office assistants—Frances

United's gagmen concocted this for a ship's "christening." Such a reality would have been extremely dangerous. United press agents also thought up an airport archery range.

de Marquis and Ted Stern, both of whom have learned the ability to exploit under the guidance of their suave superior. Neff is perhaps the closest of all his brethren to the dominating impressario type personified by Pan American's Van Dusen.

In direct command of United's publicity force is Bob Johnson, whose introduction to aviation press agentry came several years ago as assistant to Harold Crary at Seattle. Johnson relates the tale of his first association with aviation: he was attending the school of journalism at the University of Washington when a call came from one Harold Crary at the Boeing factory for someone who could write stories. Bob Johnson got the job and rose, under Crary's wise counsel, to his present job as director of United's publicity and advertising. Besides Bob Neff, Johnson has Dick Smith, formerly of American Airlines, as his assistant in Chicago —further assistance coming from Art LaVove, (formerly with the Los Angeles *Times*) in Southern California, Pascal Cowan in San Francisco and energetic, productive Dick Rummel in Seattle.

To round out the Big Four is Eastern Airlines with soft-spoken Beverly Griffith as its director of public relations. "Bev" is liked by all who come in contact with him. Aided by Tom Collison, Bev is practically a one-man publicity department—so, if he doesn't answer his mail as promptly as he might, you can believe that he's out riding one of Eastern's Douglases to supervise some publicity deal. Griffith is fortunate in having air transportation's most publicity-minded president as his chief—Eddie Rickenbacker. Rickenbacker has probably forgotten more about publicity and public relations than most of the Ballyhoo Boys ever will absorb.

Prompted, no doubt, by the large amount of space gotten by the major airlines, many of the small lines are becoming publicity-minded. Chicago and Southern Airlines, for example, baited bubbling George Bounds away from Parks Air College to take hold of their publicity and advertising. A representative job is being done here and should be a lesson to those other small lines that point out that they need no publicity structure. Herb Baldwin of Boston and Maine Airways is a splendid example of a successful small airline press agent. A graduate of the city desk of the Boston *Post*, Baldwin is probably New England's best aviation press agent. He is vice-president of the Boston and Maine Railroad and does not have as much time as he'd like to devote to the airline.

However, Herb Baldwin has found it necessary to like aviation against his own will. He didn't like airplanes, nor did he like to fly—but the railroad acquired an airline and he had no choice. Boston reporters will tell you the legendary story about Baldwin when air service was inaugurated between Boston and Bangor, Me. Amelia Earhart was aboard the first plane with newshawks. Baldwin was host for the day, but went in advance of the party by train and then returned to Boston by train. Since

(*Continued on page* 68)

For want of something to do, United gagsters worked up this "bicycle plane."

Halloween was American's excuse for this, another sample of a stewardess's "duties."

This American Airlines gag "campaigned" against the tracks through Chicago airport.

A field day for United's press agents was the transcontinental flight of this baby panda. Curiously, though, all airlines specifically forbid animals aboard their ships.

FRANK TINKER, Jr.

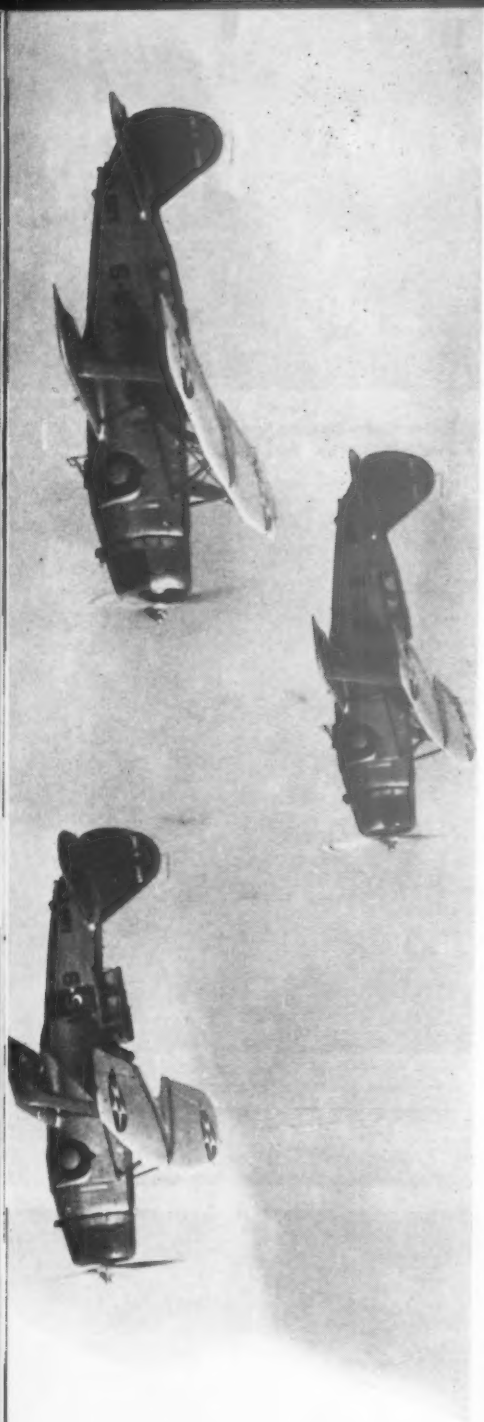
discusses what will be an important feature of the next war in the air. He presents some startling opinions in

The Case for the DIVE BOMBER

JUST when I had gotten well settled down into what passes for peaceful retirement in the state of Arkansas the editor writes and wants to know if I have any ideas for another article. It so happened that his letter caught me working on an article about my experiences in Spain which emphasizes the peculiar advantages, in modern warfare, of a particular type of plane. However, true to Arkansas traditions, most of my work had consisted in putting it off from day to day until his missive prodded me on to completion of the job. So here goes:

There is one modern use for planes which was not even tried experimentally in the World War. That use is for dive bombing. We used dive bombing planes very effectively in the Spanish Civil War —probably much more so than they have been used in the war now going on in China. The planes we used were the Russian developments of our own Boeing P-12; which were known over there as "Chatos". They had racks for four 25-pound demolition bombs under their lower wings. They did very well at dive bombing but there was still plenty of room for improvement, mainly because they were designed primarily for combat purposes.

General Franco had no dive bombing planes at all when I was in Spain and, as far as I can find out, he still has none. The Italian Fiat fighters had in-



The U. S. Navy has had outstanding success with the dive bombers they have today. Above are three Navy Curtiss SBC-3's.

The author did some dive-bombing in Spain with Russian "Mosca" fighters like those at right. Though not ideal, they worked

ternal racks for small bombs but they had to be released while the planes were flying horizontally and were not very effective. The pilot couldn't even see the target when he released his bombs so you can imagine how accurate they were. Our bombs, on the other hand, were released at targets which we could see very plainly in our telescopic machine gun sights. We could drop our bombs from altitudes as high as 2,000 meters (over 6,000 feet) with amazing accuracy. On the other hand, we could also drop them from just over the tree tops and then utilize our speed and maneuverability in making good our escape from any anti-aircraft batteries which might happen to be in the vicinity of the objective.

For use against trench troops the dive bombers were hard to beat. Prisoners made no bones about admitting that they were much more afraid of the Chatos than they were of the heavy bombers. One reason was that they could easily see the Chatos, which came down to altitudes far below any that the heavy bombers would dare to approach. Another reason was that the dive bombing attacks were usually accompanied by strafings from the four synchronized machine guns carried by each Chato.

The surprise element was of great importance, too. The enemy trench troops usually had time to get to dugouts and bomb shelters when they were attacked by heavy bombers but the Chatos could sneak over under cover of the clouds. The first warning of one of their attacks would usually be the screaming of the wind through their rigging after they had already started down in their dives. By the time the last planes dropped their bombs the first ones would be coming around in their strafing dives. About all the poor fellows on the ground could do was lie where they were and hope for the best. However, a couple of incidents which occurred in Spain will best illustrate the advantages of the dive bombers.

The terrible demoralization of Mussolini's Blackshirt troops at the battle of Guadalajara was largely due to the incessant attacks made upon them by our Chatos. We had plenty of planes and were easily able to keep at least one squadron of Chatos at work over the battlefield at all times; that is, at all times during daylight hours. On some days each squadron would make as many as five or six flights across the lines with demolition bombs. On each trip we would also make it a point to use up all of our machine gun bullets before returning to the home field.

The sturdy Curtiss SBC-3 (above) is used by the U. S. Navy for dive bombing. Below is a makeshift bomber being used in Spain. It is a converted DeHavilland Rapide.

At the height of the Italian offensive their central column was actually so close to our flying field at Guadalajara that we could easily hear the sounds of the battle. So we were really fighting with our backs to the wall and were doing everything we could to stop the drive. How well we succeeded was shown by the results of the battle.

The Italian general staff played into our hands by making the grave tactical error of trying to advance too fast. The washing out of a bridge isolated their central column for several hours during the most critical part of the battle and the entire offensive went to pieces. They had the further disadvantage of seeing their Fiat fighters desert them after a few short encounters with our Chatos and Moscas.

The weather at that time was very wet—with heavy rain squalls driving across the battlefield one after the other. As a result, the trenches dug by the advance Italian troops were little better than ditches. They couldn't make them very deep or they would fill up with water. They were so shallow, in fact, that we could easily attack the men in them from almost any angle with either bombs or machine guns. Under those conditions it was not at all strange that their morale did a nose dive.

After the collapse of the front lines of the central column the slaughter by our Chatos was terrific. On the day of the final collapse we were on the ground only long enough to load up with gas, oil, bombs and bullets. And we were working in coordination with heavy bombers, tanks, cavalry and infantry.

On that final morning our heavy

The author did most of his successful dive bombing in Spain with Russian Chatos (below).

bombers started things rolling with a thorough bombardment of the Italian artillery emplacements. We Chato pilots protected the heavy bombers until they were all clear and then we attacked the trench troops with both bombs and machine guns. While we were doing this there were two squadrons of our monoplane fighters flying around up above to see that we weren't caught by surprise. The Fiats made one half-hearted attack that morning—lost five planes — and were seen no more for the rest of the day.

Each of our Chato attacks was carried out in the same manner. As soon as we dropped our bombs we would break up into loose patrol formation and start strafing the trenches. While doing this we had to take care that we kept clear of our tanks, which always started advancing as soon as our last bombs struck the ground.

Those poor Blackshirts were certainly in a precarious position down below. When they flattened out to take cover from our bombardments they weren't able to offer any resistance to the advance of our tanks and when they tried to run from the tanks we were ready for them with our machine guns. As soon as our tanks reached one of the shallow trenches they would straddle it—clean it up with gunfire—and then wait for cavalry and infantry to catch up and consolidate the new positions.

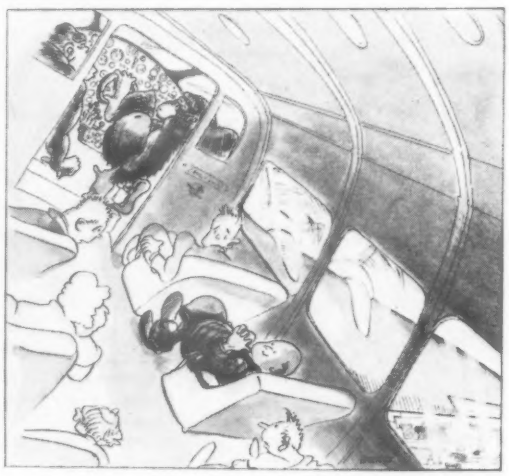
About the middle of the day the Italian retreat became an out and out rout. And everything down below was so muddy that most of the retreating had to be done on the main highways—which were wide open to murderous attacks from the air by the Chatos.

There were only three roads leading from the battlefield and they all converged at a crossroad, with a fourth road leading out to the northward. Just when the traffic jam at this crossroad was at its thickest, six of our heavy bombers sailed majestically out of the clouds overhead and bombed it. Three of them bombed at a time and their aim was excellent. All of their bombs burst within a radius of about a hundred yards around the center of the crossroad.

The slaughter must have been frightful. We could see huge trucks whirling end over end through the air, with men and equipment flying out of their open rear ends. But that catastrophe was just the beginning of their troubles down below. As soon as the smoke settled we went down in our Chatos and started machine gunning the survivors. We kept them demoralized for about 20 minutes—until our tanks and cavalry arrived on the scene and took charge.

Captured Italians said later that that was the most terrible point in the entire battle. They said that after the heavy bombardment of the crossroad there hadn't been a movement of anyone for about a minute. It was just as though the world had come to an end and there was nothing worse which could happen to them. They just lay there on the ground, completely dazed. Then came the accursed Chatos—like a swarm of angry mosquitos. They were only too glad when the tanks and cavalry came up and captured them—it was their first moment of peace in over ten days.

Now for the second example of the usefulness of dive bombing fighting planes. The Chatos were also used extensively for observation purposes. Here, their speed and bomb carrying ability had peculiar advantages. Usually only two of them would be sent out at a time—one of them to do the actual scouting while the other kept an eye peeled for enemy planes. While these two were out scouting the remainder of the squadron would be getting prepared to go out and bomb anything of importance which might be discovered.



"Y'see, we've eliminated the human element . . ."

If the two scouts happened to discover anything they would streak for home at once. Then the whole squadron would take off and could usually be over the objective before steps could be taken to safeguard it.

For example: on one occasion I went out in back of the Brihuega front on a prowling reconnaissance trip with one Spanish wingman by way of an escort. On the siding of a railroad station far back of the front lines, at the little town of Baides, we discovered three large freight trains. We immediately hurried back to the home field with the good news. While we were making our report our planes were being refueled and loaded with bombs. By the time we returned to them they were ready to take off again. The entire squadron was in the air and ready for action within 15 minutes after we first spotted those freight trains.

And all three of them were still there when we returned to the station at Baides. The only explanation I could think of was that when we flew over the first time we had been so low and so far back in their territory that they assumed we were a couple of their own planes. As soon as we arrived over the station we shifted into dive bombing formation and went to work with a will. We had 12 planes—divided into four patrols of three planes each.

While we were getting into position one of the trains started down the tracks at a great rate—but it had waited a little too long. The bombs dropped by the first patrol landed all around its locomotive, which promptly blew up, causing the next few cars behind it to pile up in the wreckage and increase the confusion. The bombs dropped by my own and the third patrols landed all up and down the other two trains, which were side by side on the parallel tracks of a siding. The leader of the fourth patrol, though, failed to use his head and bombed the station itself, which was of no military importance.

After dropping our bombs we began to fly up and down what was left of the three trains, strafing the uninjured portion of them with our machine guns. There were quite a few tank cars and we concentrated on them with our incendiary bullets, with the result that most of them caught fire and exploded, showering burning oil —probably gasoline—all over everything. We were finally forced to leave by the dense clouds of black smoke which began rolling up after the explosion of the first tank cars. We were in that vicinity for only about 15 minutes but when we finally departed it was from a scene of desolation. We had done just about all the damage that could be done. At least half of the hundred-odd cars were either destroyed or burning. I doubt if a tenth of them were salvaged intact.

Now, if we had to send heavy bombers over to that station they wouldn't have been able to do anywhere near the amount of damage we were able to do with our Chatos. For one thing, it would have taken them so long that it is very doubtful if any of those trains would have been there at the station when they arrived. But the Chatos were fast enough, and carried enough bombs to be able to get to the station and get the job done in as short a time as possible. Then, too, we had the further advantage of having enough planes to have been able to take care of ourselves in the event that we had been attacked by enemy planes.

That was the amazing thing about those Chatos—aside from their dive bombing ability they were also the best fighting planes in use on either side at that time. The monoplanes were good—true—but it was the Chatos which applied the finishing touches to most of the dogfights which occurred during the time I flew in Spain.

(Continued on page 79)

FABRIC TANKS FOR SAFETY

by JOHN C. A. WATKINS

Are Glenn Martin's novel gas tanks the answer? They have been tested exhaustively and show amazing resistance.

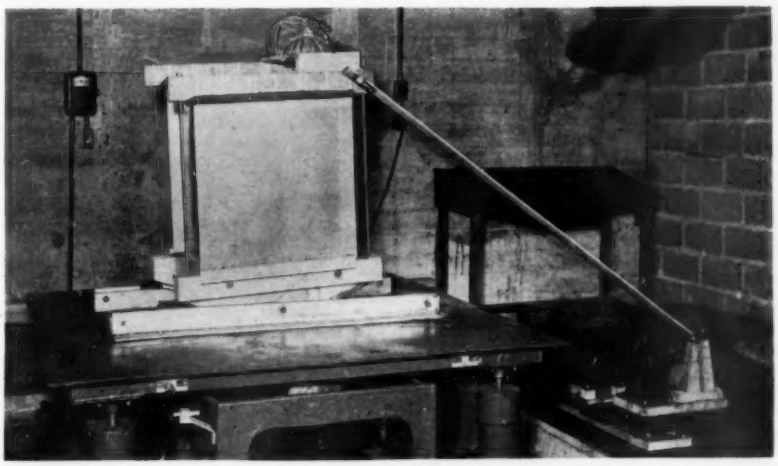
ANOTHER step forward along the road that leads to safety in the air—and fewer hazards for those who will have to fly in our next war—has been taken by Glenn L. Martin, who already has contributed so much toward safe flying.

The pioneer airplane builder has just revealed that in the ships rolling out of the final assembly hall at his Baltimore plant, the gasoline is being carried in cloth bags instead of the conventional metal fuel tanks with which aircraft ordinarily are equipped.

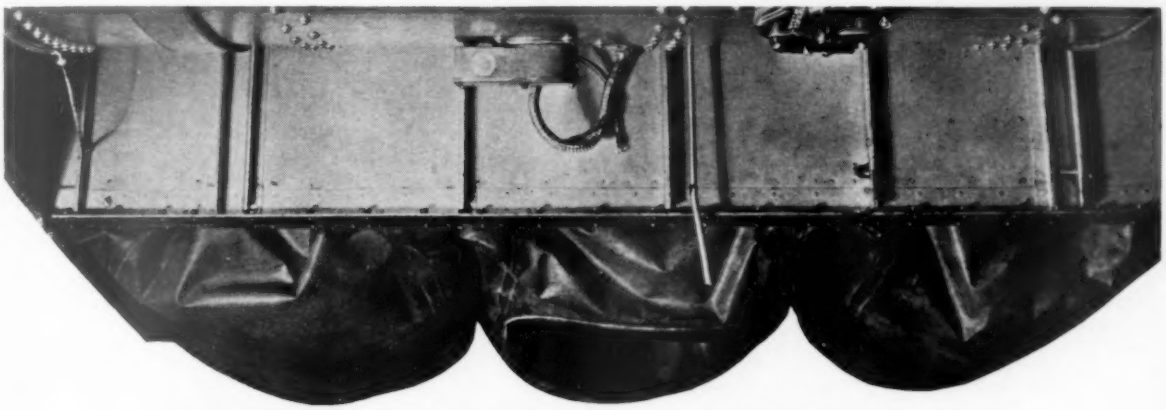
"Cloth bags" is correct: Martin flying boats and bombers use gasoline tanks made of a synthetic fabric impregnated with artificial rubber, and they are said to be far superior to metal fuel containers. Two years of tests have convinced Martin engineers of that.

As any airplane owner or builder knows, metal tanks have a lot of inherent faults. For one thing, they deteriorate under the corrosive action of the gasoline and the small amount of water that is found even in the best aircraft fuel. They have a tendency also to break down under the continued vibration to which they are subjected while in use.

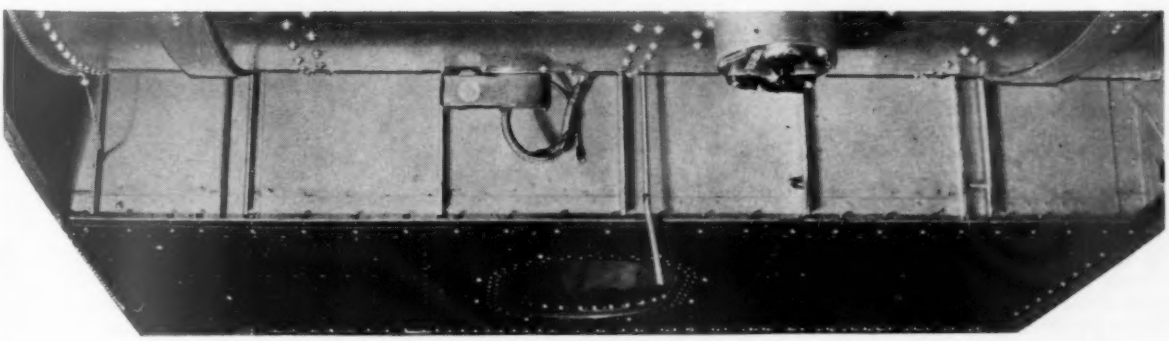
Furthermore, they weigh a lot—the

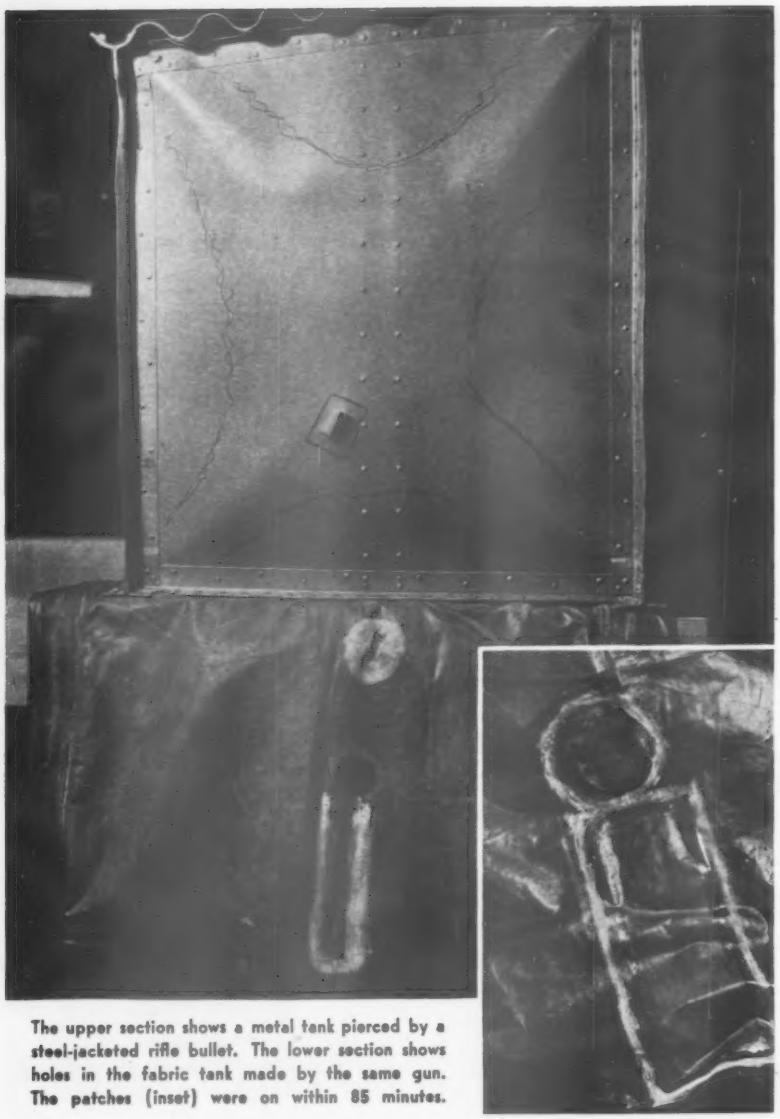


This vibration table is standard equipment for testing airplane gas tanks. Metal tanks can only withstand 15 hours on it. The fabric tank was unaffected after 700 hours.



This is a 185-gallon three-cell fabric tank in a typical wing compartment. It is shown above before the bottom plate has been installed. Below, the plate is in place, showing hand-hole to the cells.





The upper section shows a metal tank pierced by a steel-jacketed rifle bullet. The lower section shows holes in the fabric tank made by the same gun. The patches (inset) were on within 85 minutes.

lightest of them—and they're expensive to construct and fit. Weight is an important factor in any airplane and especially so in the big bombers and commercial flying boats in which the Martin company specializes. And, last of all, once they're damaged it's hard and costly to repair them and they're never quite the same again.

Mr. Martin says his fabric tanks eliminate most of those problems and he points to some very arduous tests, in the laboratory and in the air, as proof of his claims.

To begin with, synthetic rubber doesn't seem to be affected by the chemical action of gasoline. One of the fabric tanks was filled with gas and put away in a corner for *one whole year*, then cut up and inspected. The gasoline had no discernible effect. The same was true of water. And the tanks passed their first major test.

Then the Martin engineers subjected them to the most rigid measure of value of all, the standardized accelerated disintegration test on a high-frequency, low-amplitude vibrating table. In order to win approval for use in airplanes, metal tanks have to stand up under the beating they take from the vibrating table for at least 25 hours, and the usefulness of the average tanks is ended within 50 hours of artificial vibration.

Martin added an arm which imparted a rocking motion to the vibrating of the table and, at the end of 700 hours of combined vibrating and rocking—more than 10 times as rigid a test as the maximum which a metal tank could stand—the "Mareng fuel cell," as it is known, emerged fuel-tight. The tank had been vibration-tested under all conditions, from full to quarter full, so that the liquid within could slosh about freely, just as it would in actual flight, and was not damaged. The supporting structure had to be repaired several times during the test, but the fabric itself didn't have to be touched.

It proved to be much easier, also, to install the fabric containers. All the engineers had to do was design them to the shape of existing interior compartments of wings, fuselages or floats, and lay them in place very much like an inner tube is laid in place in the tire before it is inflated. The fabric tanks weren't cut to fit the interior measurements of the compartments exactly: instead they were made to patterns slightly larger in each dimension than the surrounding walls and under-surfaces against which they were to rest. This over-sizing is important. Because of it, the fabric lining never is subjected to stretching or twisting but serves solely as a static-proof, vibration-proof container, with all strains and stresses being taken by the structure of the wing, fuselage or float.

The final proof was in the ease of maintenance and repair and, especially in the case of military aircraft, the safety. Everyone knows that if a metal tank is pierced by a bullet or in some other manner, the gasoline pours out in a steady stream and the airplane either catches fire or has to get down in a hurry. In wartime, a forced landing often has disastrous results and, at any time, fire is a menace, of course.

The value of the fabric tanks in this connection has been proved in China where the Chinese government had, or maybe still has, several Martin bombers fighting the Japanese invaders. One of these ships was flying over Jap territory not long ago and a fabric tank was pierced in several places by enemy bullets. Instead of being forced down or having to bail out because of fire, the pilot was able to fly more than 100 miles back to his base where the tank was repaired with a patch similar to those you use on an inner tube, and the airplane was ready to take to the air again.

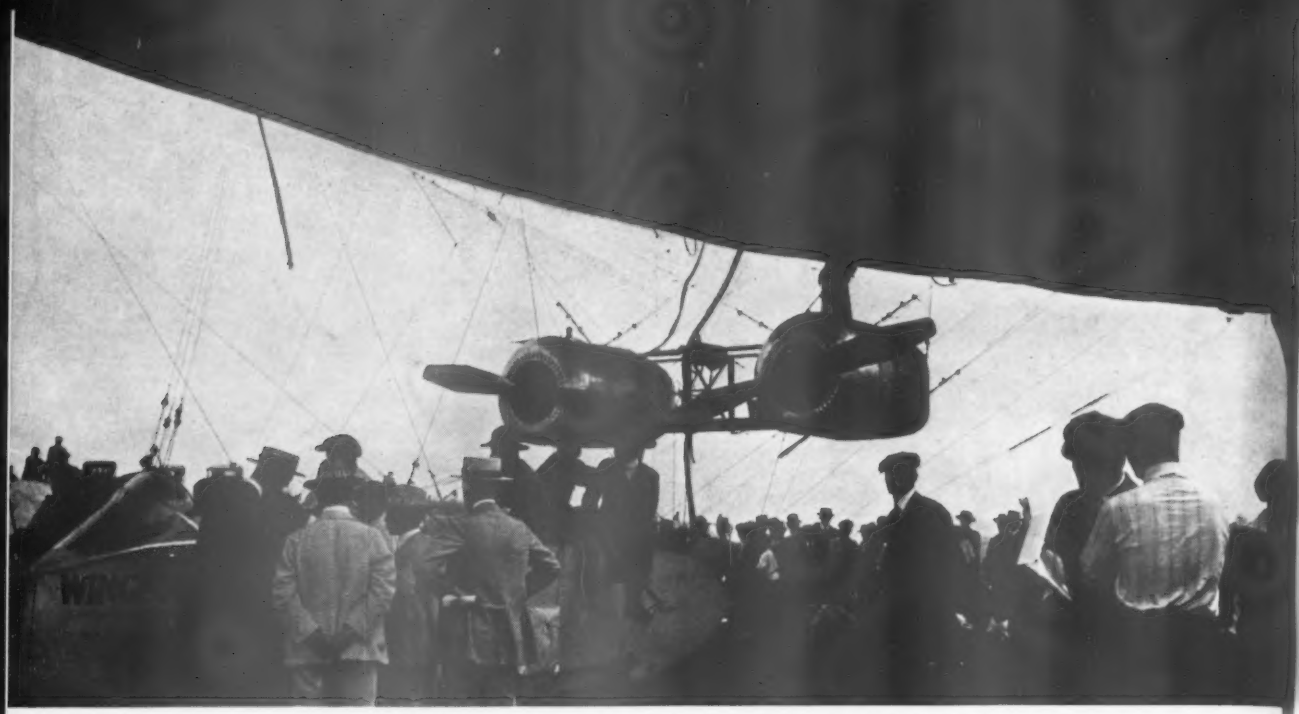
This was possible because punctures of a Mareng cell leave a slit in the fabric instead of a definite hole. Under the internal pressure of the gasoline the fabric snaps back into place and cuts a spurting leak to a slow drainage of fuel through the narrow opening left by the slit.

(*Continued on page* 77)

This is a fabric tank installed in a shell representing a metal wing's interior.

SLEEK TOURER

This trim Cessna was snapped while flying over San Francisco's picturesque harbor and suburbs.



This picture was taken a few minutes before the start of the fateful flight.

The First Caterpillars

by GEORGE R. REISS

Twenty years ago this breath-taking story actually took place. Today the two sole survivors look back on that ill-fated flight of the Wingfoot Express.

Henry Wacker

John Boettner

AMERICA'S Caterpillar's, Nos. 1 and 2, are preparing this year to celebrate their 20 years of membership in the Caterpillar Club, that mythical fraternity, so democratic that its membership includes on equal footing multimillionaires and WPA workers alike, so exclusive that no sum of money will buy an initiation.

Caterpillars, Nos. 1 and 2? Sure, Henry Wacker, No. 1, and John A. Boettner, No 2.

Henry Wacker and John A. Boettner earned their memberships in the club—the one club that never conducts a membership drive nor ever collects an initiation fee—virtually simultaneously, Wacker a split second first.

They plunged into their memberships when they plunged from the flame-enveloped airship, the *Wingfoot Express*, that beautiful midsummer's afternoon, July 21, 1919, over the heart of the teeming Chicago Loop district.

Thus, they became the first of that now imposing list of airmen—military aviators, crack commercial pilots—and non-pilots, too—who have saved their lives by plunging to safety under silken umbrellas from burning or disabled aircraft, a list which includes many of aviation's outstanding personalities—Lindbergh, Doolittle and the others.

These succeeding Caterpillars have written into the skies a series of thrilling stories—stories of courage and daring and adventure and tragedy—but none so thrilling, so filled with adventure and with tragedy as the story of these first two Caterpillars, Henry Wacker and John A. Boettner.

It is another of the stories of the succeeding tragedies that have fallen over the years the ill-starred hydrogen gas-filled airships, the *Roma*, the *Hindenburg*, and the others.

Back in 1919, the Goodyear Tire & Rubber Company began its experiments with non-rigid airships—the experiments which resulted in construction in later year of its large fleet of airships, the *Pilgrim*, the *Mayflower*, the *Puritan*, the *Vigilant*, and the others that carried safely so many hundreds of thousands of passengers under their helium-filled bellies.

The first—and the most unfortunate—of this famous line was the *Wingfoot Express*. The *Express* was a crude, flabby non-rigid gas bag, ungainly and ugly and awkward. One hundred and 58 feet long, she was inflated with 190,000 cubic feet of highly-inflammable, but highly buoyant, hydrogen gas. Dangling below her belly were two 75 h.p. air-cooled engines (the latest aircraft engines of that day), and a clumsy open 10-passenger gondola which somewhow reminded one of the big awkward barges from the Old Mill at the amusement park.

Her builders had high hopes in that flabby, ugly duckling of the air—for,

to them, she wasn't an ugly duckling. She represented the latest and finest in lighter-than-air craft, their hopes and dreams for building for America an important place in the lighter-than-air field.

The *Express* was assembled in the summer of 1919 at White City Park, a summer amusement park, near Chicago. And then came her big day, July 21, 1919.

The *Wingfoot Express* was that day finally completed. Her engines were hung in place and tested, her controls were hooked up, every fitting was pronounced perfect, she held her gas without leakage Now she was ready for her trials—and for her ill-fated last hop which was to make Wacker and Boettner Caterpillars and to bring death to 13 others and dash her builders' high dreams rudely to earth.

A huge crowd of curious lined the exhibition field and pressed in close as the ugly duckling was "walked" carefully by a crew of ground hands from her shed. her flabby sides swaying and convulsing in the gentle wind. And her crew—the veteran pilot, Boettner, a huge hulking brute of a man; the old airplane mechanic, Wacker, who had his misgivings about these clumsy, unwieldy "sausages" after his long experience with planes, and Mechanic Carl Weaver, an enthusiastic youngster—climbed proudly into the gondola. The engines were started, warming slowly, Boettner toyed idly and nervously with the controls. Remember, this was the first test hop. Then Boettner raised his hand hand, suddenly shouting:

"Up ship."

Instantly, the ground crew members loosened their holds and stepped back and the big ship, like a suddenly released pigeon, rose majestically into the air, her big wooden air screws churning. For an hour, the dirigible soared over downtown Chicago, as hundreds of thousands of pairs of curious eyes—eyes of pedestrians on the streets, office workers leaning from their windows, and others —followed her every movement.

Finally Boettner reluctantly guided her back to the field.

"Perfect," he said, his eyes shining with enthusiasm, as the ground crew brought her firmly to earth. "She handles perfectly. Bring on your passengers."

Wacker and Weaver, the mechanics, said nothing, smiling proudly as they perched precariously on the gondola and examined their engines. And, impressed by Boettner's enthusiasm and the nonchalance of Wacker and Weaver, the first two passengers selected from a long waiting list—M. G. Norton, a staff photographer of the Chicago *Herald & Examiner*, and Earl Davenport, a writer—pressed eagerly forward.

Flustered by the crowd's attention, Norton and Daventport joshed nervously as Boettner, Wacker and Weaver fussed with their parachutes and safety belts.

"Never mind a parachute for me," laughted Davenport. "If anything does go wrong, I'll be scared too stiff to jump anyway."

"And me, too . . ." echoed Norton.

Above: the takeoff. Left to right in the gondola are Boettner, Norton, Davenport, Wacker and Weaver. Below: the tragedy itself. Lowest chute is Wacker, next Boettner.

"Everyone who rides this ship." replied Boettner. with finality, "rides in a parachute."

Boettner was a hard, firm man—one with whom one doesn't argue. And that ended the argument. Boettner, the old airman, himself wasn't too sure of the value of those 'chutes—frills he called them—but his orders were to wear them and he was too good a soldier to refuse an order.

But do you blame him for doubting? Parachutes then were new-fangled equipment, untried and untested in emergencies; crude and inefficient and unreliable judged by 1938 standards for the carefully-tested, well-made umbrellas. Besides, no one had ever saved himself before with one in an emergency—although stunt jumps were common enough.

Davenport and Norton slumped nervously in their comfortable chairs to duck the anticipated air stream; Boettner settled himself at his controls, hunching under the protection of his tiny windshield, and Wacker and Weaver settled themselves nonchalantly near their precious engines, contemptuous of a bit of air.

(*Continued on page 78*)

These are Douglas O-38's of the Illinois National Guard's 108th observation squadron.

SKY

by MAJOR ROLAND BIRNN

Any opinions stated herein are not necessarily those of the War Department

This is the story of an unusual group of flying Americans—the National Guard airmen. Their story is a modern-day saga of what men can do if they want to.

WHEN a man pursues a hobby and does so in the face of exceptional hazard; when he gives up one evening a week, most of his week-ends and his summer vacation for this hobby which furthers the national defense—and does so willingly and gladly; for that man as a patriotic citizen we should have nothing but the highest praise.

When, in addition, he is so adept at this hobby that professionals at the game admit he's as good at it as they are, then you can be sure of something else—that the fellow at whom we're casting bouquets is a member of the National Guard air service, a flying militiaman, a fellow who loves his country and his flying, and works hard and well at it.

Hard-boiled and critical as they are toward even themselves, regular Army flying men openly admire the high proficiency of these 19 observation squadrons and their detachments, stationed in as many states, which are equipped and trained to furnish the "aerial eyes" of this country's active National Guard ground troops.

Each squadron consists of about 100 enlisted men and over 20 flying officers. Eighteen squadrons are assigned to National Guard infantry divisions and designated as "Division Aviation", the 19th squadron, from Arkansas, being designated for corps use. The 18 divisional squadrons have photo sections, and all 19 squadrons have a medical detachment headed by the squadron's flight surgeon.

National Guard aviation first was organized on its present scale right after the World War and the squadrons re-

This National Guard plane saved 35 snowbound California miners from possible death when it dropped more than 600 pounds of supplies to them. Snowdrifts balked rescuers.

Above is the National Guard squadron based at Spokane, Washington, taxiing out for flight maneuvers.

Y MILITIAMEN

ceived federal recognition between the years 1921 and 1930. In their operation, the states furnish the air base and hangar facilities, while the federal government furnishes the airplanes and allied technical equipment and provides pay for the federal caretaker mechanics and all personnel in the unit.

According to the National Guard Bureau in Washington, all training in these guard units is directed toward the development of a well-rounded observation unit. Flying is all done on a pre-arranged schedule, and missions such as would be performed in war in artillery observation, infantry contact and liaison, using radio and other means of communication, are performed under conditions approaching as near as possible those to be encountered in actual service. This is done at prescribed drill periods or at other times.

Planes are always available for the use of pilots and pilot-observer teams for either day or night missions and they are required to fly regularly and frequently. The average pilot time on service missions averages over 100 hours per pilot, on day and night missions, in good weather and bad.

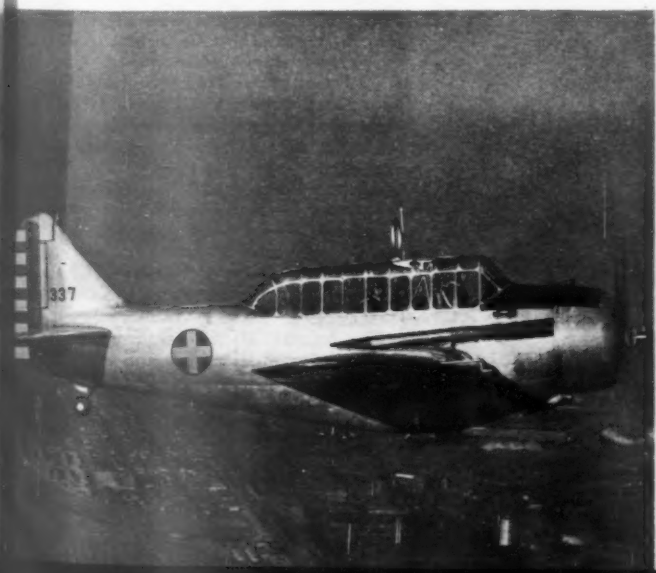
Each squadron has an armory drill once a week, and those officers and men present for duty receive a day's pay. Generally there is a lecture by the regular Army instructor or a well-qualified officer or non-com in the squadron, or radio buzzer practice, or some other form of instruction. Where night flying is scheduled the instructional period is followed by such flying. In addition to the armory drills many of the members of the squadron report at the hangar on Saturday afternoons and Sundays and holidays for flying or working at their specialty in the hangar, the offices or the shops.

One of the most important functions of the National Guard aviation squadrons is the photography and air mapping duties of each unit. Most of the active flight work of these squadrons is on such missions. A great deal of mosaic mapping is being done by National Guard squadrons, all of which, when assembled, will be of immeasurable help to all interested military and civil groups. In addition, each National Guard squadron's photo section is an important and well-run part of the squadron itself.

The annual two-week periods of active duty for each squadron see all these functions concentrated into similated wartime operations. Then the squadrons indulge in artillery spotting, gunnery, liaison work as well as the various ground duties.

Approximately half the flying officers have had wartime flying service or are real old timers with plenty of experience. Of the remainder, about half are graduates of the Air Corps training center and the other half have been trained in

Sleek North American O-47A's are replacing the present obsolete equipment. This ship belongs to the Illinois National Guard squadron.



The underside of the O-47A is designed especially for observation work. The hatch and window are for the observer.

When certain C.C.C. camps in Idah · became isolated not long ago, Washington National Guard planes flew to the rescue with the food and supplies being assembled above.

Supplies are attached to bomb racks. The pilot drops them by pulling bomb releases.

commercial flying schools or received their training in the squadron. Some of the original non-graduates of the Air Corps training center have availed themselves of the opportunity of taking a short intensive course there to improve their efficiency. There are about 10 observers—non-pilots—in each squadron. Ordinarily these enlist in the squadron and receive their observer's training in that unit, being commissioned as second lieutenants when they have satisfactorily completed their observer training. Many of the National Guard pilots and mechanics are employed in similar capacities by the commercial airlines.

The enlisted men receive training in the squadron much the same as those in the regular Army Air Corps. However, many of them come into the squadron with an excellent knowledge of some specialty, such as engine mechanic, crew chief, airplane mechanic, radio mechanic or operator, armorer, etc. Many of the enlisted men in the Guard squadrons take courses at the Air Corps Technical Schools at Chanute Field, Illinois, or Lowry Field, Denver, Colorado.

Once a year—generally during the Summer—each squadron goes into the field for two weeks. Most of such time is spent in maneuvers with the infantry division to which the squadron belongs, in cooperative missions involving the getting of information of the "enemy" or the terrain and transmitting such information to the ground commanders by means of drop messages, radio, or visual signals and receiving information and orders from the ground commanders by means of pick-up messages, radio, and code panels spread on the ground. The picking out and locating of artillery targets and the adjustment of artillery fires on such targets is also an important part of the squadron's work in the field. Many hours are also spent in flying missions for the training of anti-aircraft artillery outfits, in flying towed targets at which the big guns and machine guns fire, or in flying certain courses and altitudes in training the operators of anti-aircraft sound locating and tracking devices.

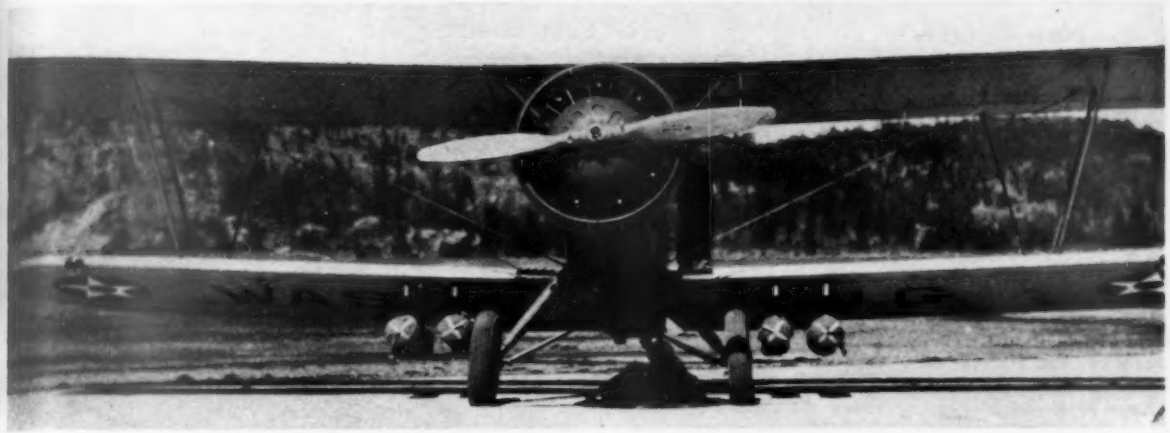
The War Department intends supplying each National Guard squadron with 10 O-47A's.

A number of squadrons have gone into the field during the summer on gunnery practice work. One popular gunnery range is Eglin Field, Florida, a regular Army Air Corps gunnery station on the Gulf of Mexico about 40 miles east of Pensacola. Ground targets and aerial towed targets are fired upon. Not only does the armament and operations crews receive training in such work but the communications details handle a large amount of radio traffic in directing the pilots of the target towing airplanes and those pilots and observers doing the firing.

Last summer, several Guard squadrons took part in the large-scale maneuvers involving regular Army as well as National Guard air squadrons and ground troops, fighting wars as realistically as possible in time of peace. When the squadron goes into the field its members receive full army pay for that period.

Many of the squadrons started their flying career equipped with the humble Jenny. A few still have several obsolescent Douglas O-38B's, or the later O-38E's or F's. However, these are giving way rapidly to the new O-47, the three-place North American mid-wing job with all the latest in gadgets and equipment. The objective of the War Department is to have each squadron equipped with 10 modern type airplanes. Airplanes are contracted for especially for these squadrons which do not, by any means, receive the cast-offs of the regular Army Air Corps or the Air Corps reserve.

The regular Air Corps furnishes one officer (a graduate of the important Air Corps Tactical School and in some cases of the Command and General Staff School at Fort Leavenworth) as instructor to each squadron, in addition to an experi-



This is one of the Washington National Guard Douglas O-38's with its "bombs" of food and supplies attached. This type of duty is automatically relegated to National Guard squadrons whenever the occasion arises. They have saved many lives.

enced non-commissioned officer as sergeant instructor to oversee the instruction of the enlisted men. So high, however, is the squadrons' tactical proficiency that in most cases the instructor acts principally in an advisory capacity and as a liaison officer between the regular Air Corps and the National Guard squadron, and coordinates their respective activities.

The author has had the honor of sitting in recently as guest of a squadron on its drill night. Roll call for the officers was followed by 15 minutes of intensive radio buzzer practice. Every officer, including the squadron commander, took part. Starting in at six words a minute they speeded up their rate to 10, then 12 words. Some dropped out, or faltered and missed words or groups. Others kept on to 15 words a minute. Four officers kept on sending and receiving even above 15, until the period was over. After a brief rest, the instructor began the discussion of a theoretical problem in observation aviation, fresh from the files of the Air Corps Tactical School. This was followed by the squadron operations officer's lecture on the similarity between the discussed problem and the situation which confronted the squadron on their past summer's maneuvers. Meantime the enlisted men had gone through a quarter hour of close order drill under their own sergeants and corporals, followed by instruction by the civilian mechanics, full-time state employees. The communications section, later visited by the author, were being given a talk and instruction by a factory representative on the care and maintenance of a newly installed radio set.

No description of the National Guard squadrons would be complete without mention of some of the colorful characters making up their personnel. Readers may remember a flyer named C. A. Lindbergh, famous since 1927, who at the time of his famous New York to Paris flight, was a member of the Missouri squadron.

Lieut.-Col. John N Jeffers, former commander of the California squadron and now Air Officer on the California Division Commander's staff, is a holder of the French Croix de Guerre and United States Distinguished Service Cross, awarded for heroic service with the 94th Pursuit Squadron during the World War.

Lieut.-Col. George A. Vaughn, former commander of the New York squadron now is Air Officer of the 27th Division. The second ranking living ace of this country's air service, he is officially credited with 13 victories over enemy aircraft and holds the British Distinguished Flying Cross and this country's Distinguished Service Cross.

Holder of the French Medaille Commemorative and the United States Distinguished Service Cross is the former squadron commander of the Indiana unit and present Air Officer of the Indiana Infantry Division, Lieut.-Col. Harvey Weir Cook. He is officially credited with the destruction of three enemy airplanes and four enemy balloons, thereby bearing the unofficial designation of World War ace, one of the few still living today.

Two other ex-Squadron Commanders, with enemy airplanes to their credit during World War action, are Lieut.-Col. Errol Zistel of Ohio with three enemy aircraft, and Lieut.-Col. William D. Tipton of Maryland with two airplanes and one balloon. Both these officers have been promoted from their former Guard squadrons to the position of Air Officer on the staff of the ground divisions of their respective states.

Eager to be enrolled in the squadron near his home, many a young man has written for information to the state's Adjutant General or to the War Department or the Air Corps. Such inquiries are generally referred to the Squadron Commander of the unit concerned, who puts his "O.K." on the application of those worthwhile candidates for enlistment provided vacancies exist in the squadron. Good mechanics, skilled clerical workers, expert radio operators, even

(*Continued on page* 84)

The airplanes on the production line of the North American company are O-47A's for the re-equipping of National Guard squadrons. These ships have all the latest gadgets.

New Courses

SEVERAL additional instructional units have been added to the ground school facilities at the Boeing School of Aeronautics, Oakland, according to General Manager T. Lee, Jr.

An aircraft engine torque stand capable of testing engines up to 1,000 horsepower has recently been acquired by the power plants department. A new hydraulic universal testing machine is now in active use in the materials testing laboratory. Having a capacity of 20,000 pounds, it gives a great deal of information about the aircraft materials undergoing tests in compression, tension and bending. Data gathered by students on each specimen studied include its chemical composition, method of manufacture (cold-worked, pressed, rolled, hotworked, cast, or forged), heat treatment, hardness (by Rockwell hardness tested), yield point elongation, reduction area, and ultimate strength.

A photo-elastic machine has been completed and is in operation in the science laboratory. The apparatus shows visually the effect of shape on materials and the flow and distribution of stresses within them when a load is applied. Various plastic sections have been provided for use in the demonstrations.

A training room for radio operators has been constructed recently in the radio shop. After the students have secured their Second-Class Radio-telephone Operator licenses from the Federal Communications Commission and experience in the new training room, they may be assigned to United Air Lines' radio room at Oakland to acquire additional communications experience.

Good Business

UNCLE SAM'S aviation industry did pretty good business in the period from January 1 to October 1, 1938. The following figures and their value are itemized:

Commercial airplanes	$13,475,971
Military airplanes	42,622,058
Commercial engines	12,211,701
Military engines	15,424,517
Airplane spare parts	18,772,711
Engine spare parts	8,718,874
Total	$111,225,832

New Air Brake

G. M. BALLERIO of Milan, Italy, has introduced an interesting new air-brake in the form of side flaps on the ship's fuselage. By means of a mechanical apparatus the pilot can open them out near the tail of the machine. Using these flaps, which are designed to open in such a way as to oppose the motion of the machine, an unusually large braking effect can be achieved when landing.

First Boeing '307' Completed

THE airplane you see above and on the opposite page is Boeing's first landplane transport since the venerable 247D of several years ago. It is technically known as the "307" (the "314" is Boeing's *Atlantic Clipper* for Pan American Airways). Popularly, the "307" is known as the *Stratoliner* because it has been designed especially for airline use in the stratosphere.

These photographs of the *Stratoliner* were taken for POPULAR AVIATION on the occasion of its first test flight recently. After rolling it out of the assembly plant onto Seattle's airport, just one day of taxiing tests was found to be necessary before the ship's first flight.

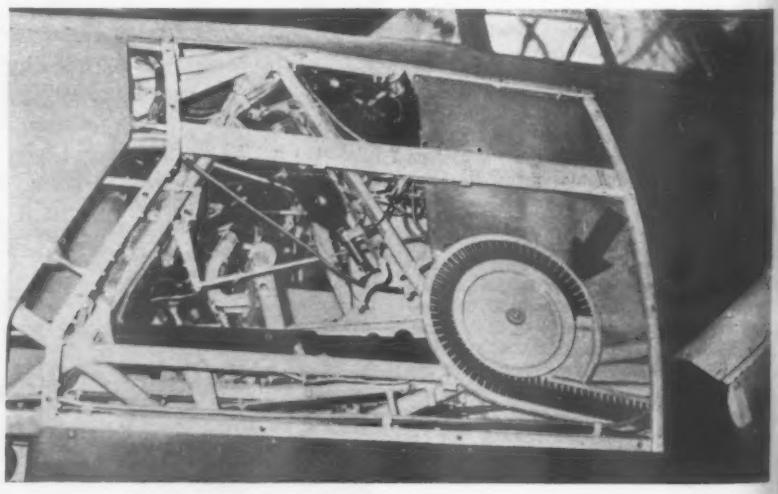
TWA originally contracted for the first *Stratoliners* and it was over this airplane that the Boeing company now is sueing that airline "for breach of contract." TWA previously had been publicizing the 33-passenger *Stratoliners* as their next great step in airline equipment advancement. Now, however, that airline will not get the ships and the Boeing company will deliver the initial ship to Pan American Airways, another purchaser.

Four 1,100 h.p. Wright *Cyclone* engines power the *Stratoliner*. To these are fitted the latest hydromatic full-feathering propellers. It will be noted in the picture directly above that this ship has an almost circular fuselage. This is to facilitate the sealing of the ship's entire insides for high-altitude flight. Air pressure inside the cabin will be equal with normal lower-altitude flight pressures.

Test Pilot Edmund T. Allen (who also tested the *Atlantic Clipper*) was at the ship's controls on its first flight. After a 42-minute flight he landed to report the ship "handled beautifully." Further exhaustive tests now are under way.

Fokker's New Machine Gun Feed

THE unusual machine gun feed below is one feature of an unusual new fighting airplane designed and built by Anthony Fokker, the famous Dutch manufacturer. The ship is known as the D-23, is fitted with two powerful engines and uses a tricycle landing gear. The arrangement shown in the picture below appears to be an admirable one. Ammunition feeds into the circular "wheel" from an easily accessible compartment in the leading edge of the wing. This compartment and some additional cartridges can be seen in the lower right-hand corner of the picture.



STRATOLINER

Boeing's new sub-stratosphere liner takes off on its first flight. The entire fuselage is pressure-sealed.

Airline pilots and stewardesses proved to be the salvation of the Hyde Park.

AIR HOTEL

by COURTNEY CASS

WE were standing next to the cigar counter when the tall, blue uniformed pilot walked up to the desk clerk and asked:

"By the way, Ralph, have you heard what ever happened to Johnny Smith?" And before you could say Minneapolis, Minn., the clerk bantered back with:

"Why, yes, one of the fellows got a card from him yesterday. He's flying for Pan Am. down in South America somewhere. Next time you're in drop by and I'll have his address for you."

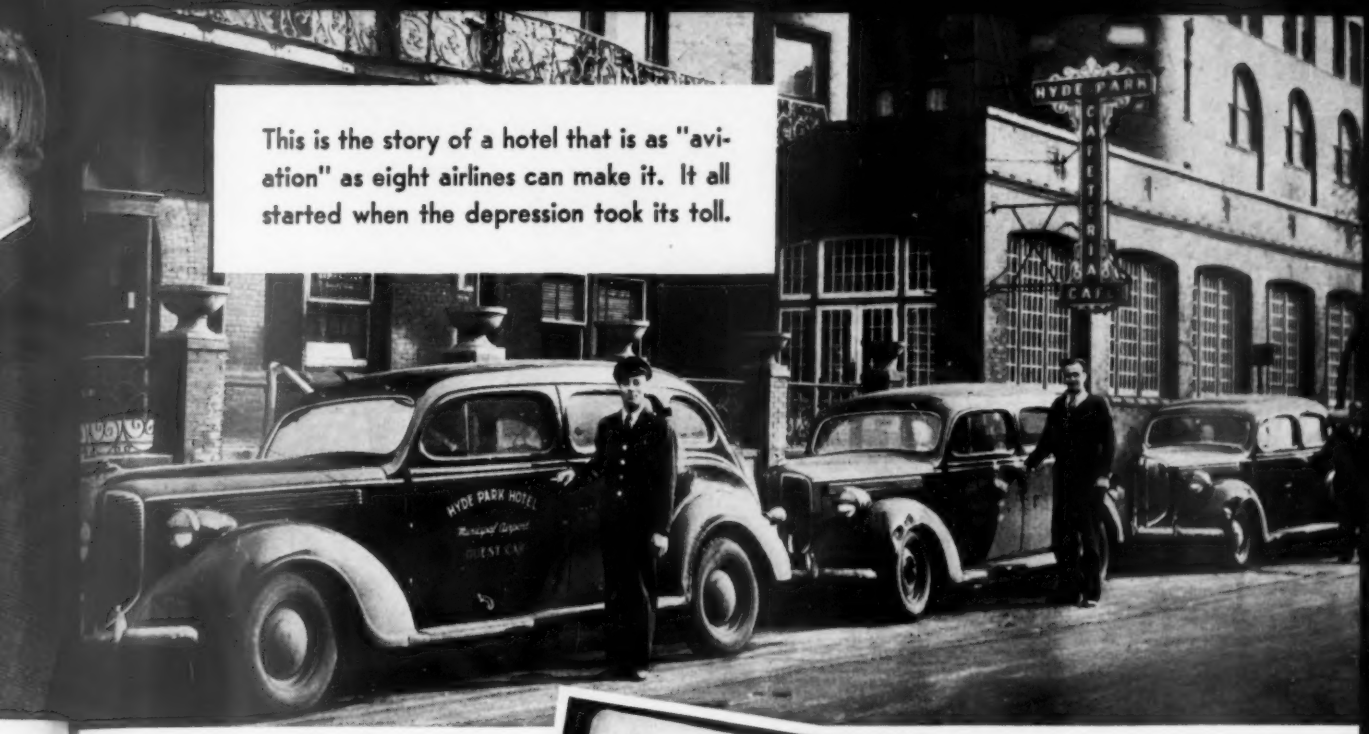
Right on the heels of the pilot a couple of gray-clad young stewardesses bounced across the lobby floor.

"Say, Ralph," one pleaded across the desk, "I'm going to Denver tonight and Ruth here is going to Newark. Our dog is up in the room and will you get a bellboy to take him for a walk?"

By this time we had begun to imagine we were in a very unusual establishment and as investigation revealed, we were indeed. We were in the Hyde Park Hotel, aviation's unofficial headquarters where the airlines of the world cross and recross and aeronautical shop talk is thicker than maple syrup. Located on Chicago's South Side near the shore of Lake Michigan, this sedate brownstone fronted hotel annually caters to thousands of pilots, stewardesses, airline executives, and others of the aeronautical world to the pleasant tune of a $200,000 annual take from aviation people alone.

It all started four years ago when the hotel business in Chicago took a decided slump following the two boom years of the World's Fair. Located only two blocks from the lake, but 5100 South

Today the Hyde Park is the official stopping of flight personnel of eight airlines.



This is the story of a hotel that is as "aviation" as eight airlines can make it. It all started when the depression took its toll.

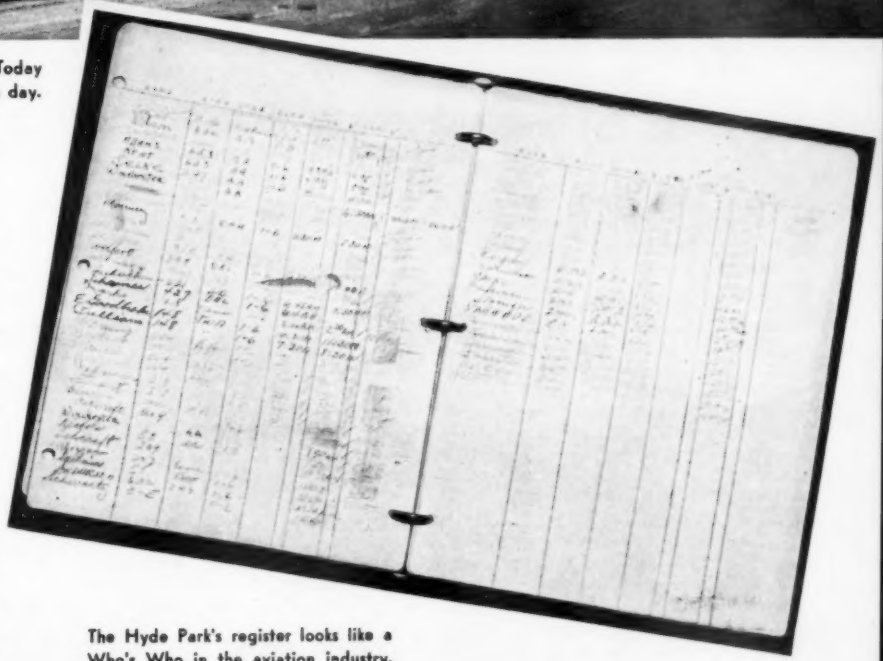
Service to the airport started with one car. Today the hotel operates ten cars working 24 hours a day.

the Hyde Park Hotel was too far from the Loop to catch the main flow of transient traffic. Principally it was a residential hotel.

With red ink dotting the ledger freely in those days, John E. Cornell, president of the hotel, knit his forehead and one bright afternoon came forth with the idea of supplying free limousine service to and from the Chicago Municipal Airport. His idea, a noble one, was to garner a large share of the transient traffic flowing through the Chicago airport by eliminating for the passenger the service charge demanded by the airplane companies for car service to and from the Loop.

The service began with one Packard car (Mr. Cornell's personal machine) and with Stanford White, a colored bell boy, doing the chauffering. That was in 1934. Today, as 1939 turns the corner to start the final year of the decade, the Hyde Park management looks with pardonable pride to a fleet of ten shining limousines that are working 24 hour duty.

Mr. Cornell was wrong in only one particular in his idea. It never jelled, with any degree of success, with the paying passengers of the airlines. But it was an immediate success with the airline personnel, who theretofore had been subjected to outrageous cab fares or hour-long rides on the drafty street cars of Chicago to the airport located at 63rd Street and Cicero Avenue. And with the pilots, stewardesses and other personnel that came to make the Hyde Park Hotel their home, there came the invariable followers—the representatives of the manufacturers, the radio and airways men, the Department of Commerce (now the Civil Aeronautics Authority) men, the well wishers and camp members of flying.



The Hyde Park's register looks like a Who's Who in the aviation industry.

Today the hotel is the Chicago personnel headquarters for American Airlines, United Air lines and TWA. Pilots and stewardesses of Braniff, Chicago and Southern, Northwest and Pennsylvania-Central also stop there. One might walk through the lobby at any time and find a typical group including Marie Hess, chief stewardess for United Airlines; Dean Smith, veteran pilot for American Airlines; Francis Moseley, engineer for the Sperry Gyroscope Company (he developed the Sperry automatic direction-finder and makes the Hyde Park his headquarters on business trips to Chicago from the Sperry headquarters in Brooklyn) and practically any other well-known name in aviation.

Two airlines—American and TWA—maintain special rooms in the hotel, rented on a monthly basis, for the convenience of those pilots who bring trips into Chicago but have their home bases in Newark, Ft. Worth, Kansas City or elsewhere. These crews, upon arriving at their operations office at the field, merely pick up the telephone, call Hyde Park 0530 and inform the desk clerk they are at the field, waiting to come "home." The desk, in turn notifies the driver of one of their limousines at the field over a direct telephone wire connection that the crew is waiting and usually before the pilots have finished checking their flight reports the car is waiting to whisk them away to the hotel.

It is the policy for stewardesses to go two and three together into an apartment. The hotel maintains several apartments particularly adapted to the use of these girls.

At the hotel all they have to do is sign the register and the bookkeeping departments of the hotel and their respective airlines do the rest.

Before retiring they notify the desk on what trip they expect to leave the following day and the clerk enters this information in a black register book and makes arrangements to call them in time to take a car in ample time to arrive at the airport and prepare their flight plans, check their plane and perform other necessary duties prior to their departure. The drivers arriving at the hotel bring back the latest weather reports and flight information from the operations departments of the airlines and this information is available at the desk to anyone interested.

Most of the pilots who stop at the hotel operate along this basis, the ones based in Chicago are usually married and have homes of their own in other parts of the city.

With stewardesses it is somewhat different. American and United make Chicago a permanent base for their girls and therefore it is the policy of these girls to go two and three together into an apartment, the cost of which is naturally borne by themselves. The Hyde Park, being a residential hotel, has a great number of apartments suitable for this purpose and the great majority of the Chicago-based stewardesses of American and United make the Hyde Park Hotel their headquarters because of the convenient car service to the field The TWA stewardesses, who are based in Newark and Kansas City, work along the same basis as the pilots, the cost of their room being covered by the airline.

Because two and three girls often go together in the hotel apartments a unique situation often arises. Take for instance the typical stewardess' apartment occupied by Joan Waltermire, Agnes Spence and Ethel Curtis of American. Miss Spence flys to Newark, Miss Waltermire to Fort Worth and Miss Curtis to Washington. Because of overlapping schedules on each of these runs sometimes a week or more passes before all three girls are together at the same time. To facilitate their household financial and personal affairs the girls have adopted the blackboard idea for passing along messages. A small blackboard, usually placed near the telephone, is furnished and if one girl is home when a telephone message comes for another she simply writes it on the board for the other to see.

Pilots, too have a similar situation with which to contend. For instance it is the policy of the airlines to room two or more pilots in each of the company rooms at the hotel for their overnight stay. Therefore a pilot flying between Newark and Chicago might arrive at the Hyde Park hotel at six o'clock in the evening; be due to return to Newark the following morning on an early trip. In the meantime the pilot of a ship flying between Ft. Worth and Chicago has been assigned to sleep in the other twin bed in that room for the night but he doesn't arrive at the hotel until almost midnight. The Newark pilot is already asleep and the Ft. Worth pilot is still sleeping when the eastbound pilot leaves in the morning. Employees of the hotel tell the story about two pilots who found themselves in this situation one morning and the first flyer out walked away with the Texas man's suitcase by mistake. It was two weeks before the proper exchange was again made.

Naturally the presence of so many aviation people in a hotel the size of the Hyde Park has an effect upon the personnel of that establishment. There are two specific instances of where relatives of hotel employees are planning careers in aviation, this desire being traced directly to their relative's relationship with airline personnel. H. R. Cox's (he is a desk clerk) sister-in-law is now training as a nurse at Methodist Hospital in Peoria with the idea of becoming a stewardess—the result of a visit to the Hyde Park and interest aroused by seeing all the uniforms.

The sister of Rexine Allan, newsstand girl, is also in training in a Chicago hospital with the specific goal of becoming an airline stewardess upon her graduation next year. She has already placed her application with one of the lines.

Aviation also has an effect on the reading matter sold by the hotel newsstand. Aviation magazines are in great demand as are all popular periodicals in which there appears a specific article or item concerning the airlines.

A courtesy extended by the Hyde Park Hotel to the general public is the transporting of air mail letters to the airport in the limousines. Mail is taken from a special box at the hotel desk and deposited at the airport post office twenty minutes later, thus saving several hours of post office handling. An average of about 300 pieces of mail are carried to the airport daily by the hotel drivers and these letters and packages are addressed to all corners of the world.

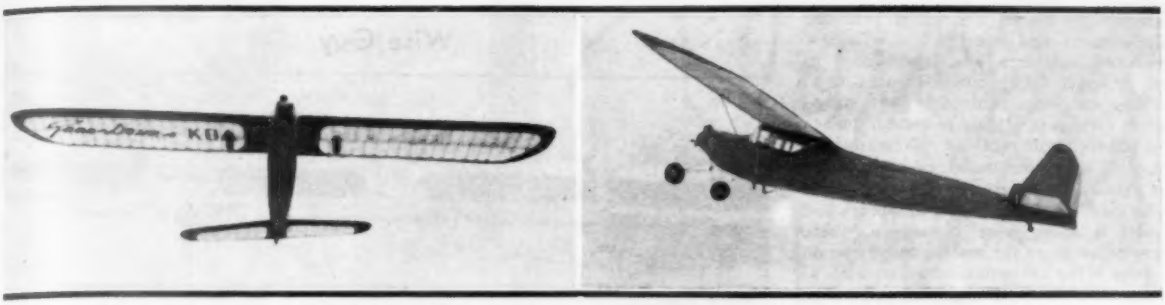
The locale of the hotel is well suited to service the many varied tastes for food and entertainment that is bound to be a part of such a wide variety of personages. The hotel itself has four restaurants and there are at least a half a dozen other good ones within a two block radius. There are three movie houses within a block's distance from the hotel and Lake Michigan is only two blocks eastward. The hotel, in addition, has equipped the sun porch on the west side of the structure, with ping pong tables and this is, by far, the favorite sport for relaxation among the airline personnel frequenting the district.

Built in 1892 by Paul Cornell, the Hyde Park is one of the best known structures on Chicago's South Side An addition was built to the original hotel in 1912 and in the period between that time and the present four "cottages" have been acquired adjacent to the hotel. These cottages are arranged in kitchenette apartments and are mostly occupied by stewardesses, who prefer to do their own cooking. The hotel and annex has a total of 333 rooms and the cottages provide an additional 48 rooms. According to E. J. Stevens, present manager of the establishment, fully half of this total is occupied nightly by airline personnel.

Not only is the Hyde Park the aviation headquarters for the airline and aviation personnel flying into Chicago or working from that city, but it is equally well known wherever airplane wings carry men across the skies.

During the recent national airline pilot's convention in Chicago, which was held at a hotel in the Loop, many pilots from such points as Honolulu (Pan American) Miami (Eastern) and Dallas

(*Continued on page* 89)



Above are two views of Mr. Isberg's radio-controlled gas model in flight. The ship performed excellently on tests.

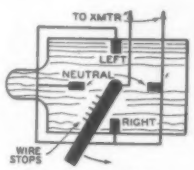
A Radio-Controlled GAS MODEL

by R. A. ISBERG

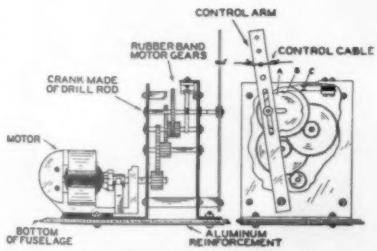
Many a model fan will welcome this article. Mr. Isberg's design is the first complete and successful radio-flown model plane we have seen.

INDESCRIBABLE thrills are in store for the pilot of a model plane whose maneuvers can be directed by radio. Mastery of two highly specialized sciences is requisite, each with its own absorbing problems and the combination presents exceptional opportunities for individual and group achievement, something which is rapidly disappearing in the amateur radio game as a result of the general adoption of manufactured receivers and transmitters. A radio amateur need not necessarily take up the building of model airplanes in order to have a part in the fun. In fact, that would hardly be advisable, because he would probably slight the airplane in order to better accommodate the radio equipment; likewise, the model builder is poorly prepared to add radio control to his plane. The ideal arrangement (if you are not already a dyed-in-the-wool "ham" and aviator combined) is to find someone in your locality who understands model aircraft or radio transmitter and receiver construction (as the case may be) and then form a partnership. This is not difficult because there are model clubs and radio amateurs in practically every town. If you don't know any of the modelers in your community, write to the National Aeronautics Assn., Washington, D. C. (every owner of a gas model is registered), for addresses or shop around the department stores until you find a clerk behind a counter full of model accessories. Radio amateurs can be found by asking the local police department, the post office or, sometimes the phone company. Another advantage of working with someone else—the expenses are shared and if the experiment ends with a disastrous crackup you will have someone to console—and to console you.

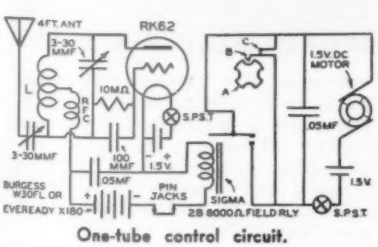
Radio direction of aircraft models is by no means a new field, it really started with radio communication however, the bulk of the equipment necessary plus the



The control stick.



Control motor construction.



One-tube control circuit.

The control unit is just a standard five-meter amateur or "ham" radio transmitter.

Above is a close-up of the controlling transmitter. Note operator's "bug" (right).

unreliability of its operation retarded development and interested only a few advanced amateurs who specialized in model boats. The method most used until recent years utilized a spark transmitter (which is illegal) to send impulses to a coherer type receiver. Naturally, the range of operation was very limited and the results uncertain.

As far as the majority of amateurs and model builders were concerned, there were other more interesting things to do and with the exception of an occasional flicker of activity, thoughts of radio control were only day dreams.

An announcement of a radio controlled model airplane competition at the Detroit meet in 1937 started the first general wave of enthusiasm. Six modelers displayed ships and control systems, but only one ship, built by Chester Lanzo, flew. His control system (for direction only) consisted of a three tube regenerative receiver operating on 80 meters, a home-made sensitive relay, and a small 1½ volt locomotive motor with a gear train to operate the rudder. The controls were demonstrated to be operable by signals from an amateur station several hundred miles away. His plane weighed five and three-quarter pounds including the one and three-quarters pound receiver and control mechanism. A one-fifth horsepower gas engine powered the ship, and I understand it was usually hand launched because this was not quite enough power for the weight of the plane.

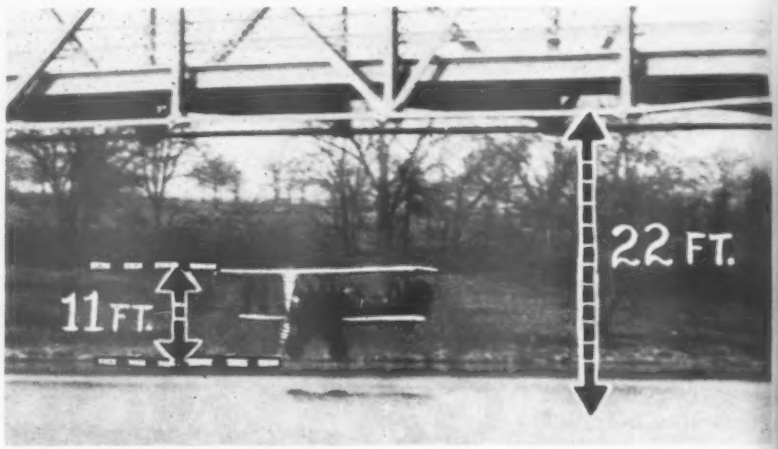
The late Ross Hull developed a system for controlling sailplanes during the same summer. His receiver consisted of a type 30 self-quenched super-regenerative detector, a 1B5 first audio tube and a 1F4 second audio stage. An Eby sensitive relay in the output circuit was used to control a solonoid which operated a simple rubber powered escapement permitting selection of right, neutral, left and neutral rudder positions. This scheme is very practical because the "pilot" on the ground knows exactly what position the rudder is in and how many impulses are required to turn it to a desired position. A system not using an escapement, such as a motor driven gear box without stops, is likely to bring about a crackup due to poor coordination between the pilot and plane.

While the 1938 entries in the Detroit competition were more advanced and were probably capable of more satisfactory operation than those of 1937, none of them could be demonstrated in the actual competition. The winning ship, Walter Good's, cracked up just after taking off, and no other entries were flown due to the uncertain wind conditions. Good's plane was equipped with two radio channels, using two one tube (type 30) receivers of the type shown in Figure 3. His control system operated both rudder tab and elevators by means of Sigma relays and home-made electro-magnetic escapements. Second place was awarded Clinton B. DeSoto on merit.

The plane used in our experiments was designed and built by Robert Van Buskirk of Denver, who has been active

(*Continued on page 70*)

Wise Guy



IF the smart-aleck who's flying the ship in the above photograph reads this, we'd suggest he read Tex Rankin's article in POPULAR AVIATION's February issue. It's on page 26 and the title is quite appropriate: "You Can't Get Away With It!" The scene, according to POPULAR AVIATION's correspondent, is the Hayden Falls bridge over the Scioto river near Columbus, Ohio. It was just by a lucky coincidence that our photographer happened to be on the river bank when the pilot dove under the bridge. According to witnesses, the pilot had two passengers in the ship at the time. Such pilots not only should lose their licenses permanently, but should have their bare bottoms spanked in public. If we could track down this showoff we'd see to it that he answered to the Civil Aeronautics Authority. Does any reader near Columbus have a clue?

A Novel Glider Carrier

THE unusual trailer shown above belongs to Richard du Pont, the soaring champion and an official of the Soaring Society of America. It was built for him by Ted Bellak who also is prominent in soaring circles. According to Bellak, the trailer was designed so that du Pont could pack and unpack his trim soaring plane with a minimum of effort and time.

The trailer is completely weatherproof, is extremely lightweight and can be towed behind any automobile with little difficulty at speeds as high as 70 m.p.h. The whole unit is 36 ft. overall and is of truss type construction with a plywood-covered roof. The remainder is covered with canvas which is doped to make it waterproof. The trailer's gigantic swinging doors (see inset) are built of steel tubing which has likewise been fabric-covered and doped. The trailer's main foundation beams are made of airplane spruce.

Electric brakes are one feature of the novel trailer.

Flying Priest

by
M. H. CARRINGTON

The Rev. Paul Schulte is daily proving that the airplane truly is an angel of peace and cheer.

This is Father Schulte with his ski-fitted Stinson Reliant.

NOW comes the flying Arctic priest —that man who has turned that dreaded instrument of death and destruction in time of war, the airplane, into an instrument of peace for carrying his gospel to the outposts of civilization, for running the errands of mercy, for bringing better living, for bringing messages of cheer or condolence.

The flying Arctic priest? He is the Rev. Paul Schulte, O.M.I., founder and president of MIVA, which means Missionary International Vehicular Association.

Utterly unlike the non-Catholic's concept of the priest is Father Schulte Adventureous in spirit and religious in mind, he is a laughing, daring, powerful giant of a man, taller than six feet, heavier than 250 pounds—that man who abandoned his tiny, tight-fitting military pursuit plane in which he ranged the skies of France to take other men's lives, to become a flying missionary in the trackless wastes of the Canadian Arctic to save other men's lives.

And a man—lucky fellow—who gets the utmost out of his work. Both jobs —that one as the aerial killer in a war-mad world and that one of carrying gospel and succor to the ends of the earth—have brought him much adventure and fun and happiness. He has built up in 10 years the greatest organization of its kind—the MIVA—which has supplied over 300 automobiles, 12 airplanes, 15 motorboats, 15 wireless stations and many outboard motors and bicycles to far-flung Catholic mission stations—stations often cut off from supplies, mail and hospitals for years on end—in the Arctic, Australia, India, Asia, Africa and South America.

The MIVA's latest innovation is the "flying church" which soon Father Schulte will fly into the Canadian Arctic to visit the communities of the devout who are without churches. The "flying church" is a huge, lumbering Fokker amphibian ship, 12-place and single-engined, formerly Gar Wood's $44,000 private air yacht. The ship has been rebuilt so that one side of its fuselage opens wide, revealing within a beautiful altar with all the necessary parapher-

This is typical Canadian Arctic wasteland over which Father Schulte flies.

Father Shulte recently purchased Gar Wood's old Fokker air yacht and has converted it into a flying church and ambulance plane. With this ship he can do the rescue work formerly performed by nuns (lower picture) in a few swift minutes or hours.

nalia for masses of the Catholic faith.

The MIVA and the man Schulte both had their origin in Germany, the religious and progressive before-Nazi Germany. Schulte served four years of the World War in the German army, first on the eastern front and later in Palestine. And it was, oddly enough, in the Holy Land that Schulte first flew and first got his inspiration which years later built the MIVA.

Stationed at a Turkish aerodrome beyond Damascus, he often enviously watched the nonchalant Turk pilots fly away in German airplanes, sometimes to return later with their planes badly shot up; and some sometimes failed to return. One day, he approached a Turkish pilot with whom he had become acquainted:

"Take me along as your observer."

"Sure," beamed the dapper, friendly little Turk. "For you, my friend, I'll do anything. For 20 marks, I'll take you along."

So Schulte, the soldier, crammed his bulky frame into the rear seat of a dilapidated, wornout Rumpler two-seater—a precarious job at best, and this was not the best. And Schulte came back thoroughly enthused with flight and with the future of aviation. No matter that that flight ended with the Rumpler on its back in a soft field; no matter that the chagrined Turk and the laughing passenger dangled humiliatingly upside down from their safety belts until rescue came.

Schulte immediately applied for transfer to the German air corps. The air corps needed such men as Schulte—daring, adventuresome, unafraid, laughing at danger or hardship. He was sent to Germany and trained as a pilot.

But the war did something to the big hulking flyer. His brother, an observer with a London bombing squadron, was shot down in England. A deeply religious man, Schulte was appalled at the greed, hate and lust of war, appalled at the needless death and destruction; appalled at the uses to which planes were being put. And here, also, he decided to become a Catholic priest.

The desolate icelands and two crossed sticks serve as Father Schulte's church.

At the end of the war, he immediately entered training for the priesthood, forgetting for the time his flying—until 1925. Visiting Tempelhof airport at Berlin, the old nostalgia came back, the spark was rekindled with him and came back the old desire to fly.

Now he was torn between two fires—his love for flying and his duties as a priest. His superiors in the church, to whom he voiced his desire to fly again, sternly forbade. The Catholic priest was forbidden to fly or even to sit at the controls. He may ride in a plane, yes; but he must not fly it, for that lowered the dignity of the priest. The church is a stern ruler. Its priests obey implicitly.

But Father Schulte nursed a persistent, annoying and rebellious dream—a dream of daredeviltry, of adventure in the skies. He nursed it in the privacy of his cell and that dream—a malignant and, it seemed to him, a sacrilegious dream—stuck with him when he said his masses.

Then came the idea that might permit Father Schulte to serve both his loves—flying and the church.

Shaken by the horrible deaths from jungle diseases and fever of brothers at the mission stations of Africa and Asia because they were separated from modern hospitals by impassable miles of almost impenetrable jungle, appalled by the stories of hardships of missionaries in the Arctic, he thought how easily airplanes might have rushed those stricken missionaries over the pestilence-ridden jungles to safety. He thought of how easily planes could have freighted in much-needed supplies to those Arctic outposts, and how those missionary priests could cover within a few days or hours the gruelling rounds that formerly required months by dog team or canoe.

A growing resentment against his superiors' orders against flying gnawed within him.

"Why not use planes?" demanded Father Schulte. "Why must the church remain stagnant?"

He voiced his ideas to brother priests and superiors. Some were shocked at his new-fangled ideas—but not Cardinal Schulte, the archbishop of Cologne. Cardinal Schulte whole-heartedly backed the idea—and thus removed the church stumbling blocks in his path. So in 1927, the MIVA was born, as a benevolent association, in Cologne.

But now began the job of obtaining money and equipment. Father Schulte begged and borrowed from Mission-minded benefactors—Catholics, Protestants and Jews alike—the world over. He talked about his plan with anyone who would listen. The money trickled in. He bought Junkers airplanes and motorboats, shipping them to Africa, working there for years.

Then finally, Pope Pius XI, hearing of his work, removed the last of the church's dissension, throwing in his enthusiastic support. At a private audience in 1932, the Pope asked him to motorize the missions of the Canadian Arctic under Bishops

(*Continued on page* 86)

THE Man UNDER THE Hood

WE'VE a major moan against the President's and the **CAA's** pilot training defense program . . . now that we know what they intend to do and how they propose to do it, we're among those who are not satisfied. . . why? . . . because the benefits of the program are to be confined to a group of college kids, 99 per cent of whom have never flown and are not seriously interested in flying.

What about all of us who are not college students? . . . and most of us now flying are *not* . . . what about those of us who have been spending our last hard-gathered dimes to buy time in light airplanes simply because we have such an urge to fly that nothing else will satisfy it? . . . why are we to be ignored unless we are attending college? . . . we're to continue to buy our own time—if we choose—and the government doesn't even recognize that we're pilots now.

It seems extremely unfair to talk about creating a great backlog of pilots and at the same time ignoring the 15,000 flyers who now hold licenses—and the 40,000 (in round numbers) who hold student permits today . . . yet that's just what the government's program is going to do . . . if we want to do anything about it *now* . . . this column is open if the pilots and student flyers want to organize for their own protection.

* * *

The **Air Line Pilots' Association** is this country's official—and only—union for those fellows . . . but did you know that only 88 per cent of all the airline pilots in this country are members? . . .

* * *

The **Army** and **Navy** are showing signs of tightening up on the release of their pilots to airlines . . . in the past, the lines have gotten the majority of their pilots from these services . . . but the generals and admirals see now that they'll need every pilot they can get to fly the military ships now on hand or soon to be delivered . . . this situation should help the commercial flying schools immeasurably . . . the **Army** particularly has been very short-handed, having more airplanes than pilots to fly them . . . not long ago we stopped by the **Douglas** plant and were somewhat amazed to see a large number of finished B-18A bombers standing out on the factory ramp . . . factory employees explained that the ships were all ganged up there simply because the **Army** hadn't enough pilots on hand to fly them away.

* * *

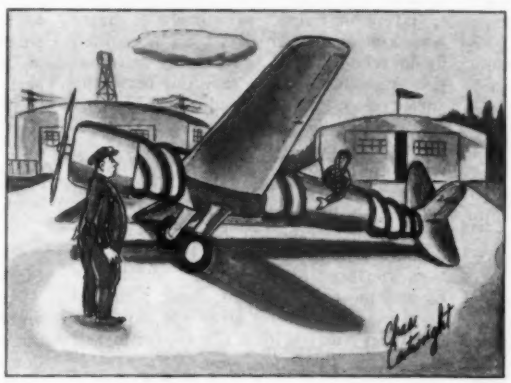
Orchid-of-the-month to American Airlines **C. R. Smith** for transferring that music-loving Negro porter from American's station at Buffalo to New York City so the lad could study the opera he loves so well . . . to date, C. R. put the clamps on his publicity department in connection with that story . . .

* * *

Frank Cordova has plans that include an attempt to break **Howard Hughes'** coast-to-coast speed record as well as his round-the-world mark . . . **Cordova,** at this writing, plans using that trimotored **Bellanca** monoplane originally built for **Alex Papana,** the Rumanian ace . . . **Cordova** now is seeking a backer.

* * *

Latest rival for the lightplane market will soon announce itself . . . lest the surprise be too great, this is to inform interested parties that their competition will come from an extremely capable source—the **Stinson** company . . . they're working on a lightplane . . . probably to be powered with a **Lycoming "50"** . . .



"She handles nicely, but don't you think we oughta do something to correct the torque?"

* * *

That new **Vultee** attack ship being built for the Air Corps is interesting . . . basically, it is just a cleaned-up version of the original military **Vultee** like that being used in China against the Japs . . . the **Army's** version, though, has many refinements . . . the rear gunner's sliding canopy operates electrically . . . incidentally, **Vultee's** also said to be hard at work on a one-place pursuit ship (though they deny it) . . . reports have it that this fighter will have no gas tanks; the ship's entire wing will be one huge tank . . . this ship is expected to be at Wright Field for tests by March 15 . . .

* * *

Dick Grace, that top-notch Hollywood crackup pilot we've been wondering about for some time, has turned up in Mexico City directing a Mexican movie . . . appropriately, the title is "Eagles of Mexico" and Dick is using the entire Mexican air force to make the picture . . .

* * *

Latest headache for certain commercial aircraft manufacturers is a **War Department** order forbidding said manufacturers from giving out any figures on their ability to produce commercial aircraft . . . in other words **Mr. Douglas** no longer can tell a prospective customer for airliners just what capacity he can turn out in what length of time . . . which causes us to wonder whether the Army's intelligence division has been able to round up every American and foreign newspaper and magazine that has printed that information in great detail within the last year . . .

* * *

Aviation men who have been in St Louis recently have been surprised by a high-performance monoplane out at Lambert Field that has had guessers spellbound these last few days . . . it's a low-winged single-place fighter based on the design of the **Curtiss-Wright** 19-R . . . but its phenomenal performance is said to include a climb of 5,400 ft. for the first minute . . . it's said to climb to 20,000 feet in about six minutes . . .

* * *

Laugh-of-the-month comes from **Braniff Airways** . . . they have a pilot's questionnaire concerning the **Douglas DC-2's** that line uses . . . prospective pilots are expected to get a passing grade on the questionnaire . . . under "General Questions" on the DC-2 is this howler: "What is contained in the one-gallon can at the rear of the pilot's seat?" . . .

* * *

An interesting fixture in **United Air Lines** Chicago meteorology department is one of those forecasting toys in which a little wooden boy comes out of a toy doorway should the weather be headed in one direction . . . if it looks like the weather'll go the other way a little girl comes out of her tiny doorway while the boy heads indoors . . .

* * *

Roscoe Turner, the man with the uniform that once had Britain's Royal Air Force agog in their efforts to identify it, has another little quirk worth recording . . . he wears *two* wrist watches, if you please . . . one set to New York time . . . the other to Chicago's . . .

* * *

Prime Minister Neville Chamberlain's Christmas card stunned Britain's aviation industry and had American aviation people, particularly the **Lockheed** company, chortling with glee . . . **Mr. Chamberlain's** card contained a beautiful flight photograph of an American **Lockheed "14,"** the same ship that flew him on his historic visit to Munich . . .

* * *

The **Boeing** company has a special kind of balancing tab on the control **sur-**

faces of all its large airplanes—the B-15 and B-17 bombers, the sub-stratosphere four-motored "307" and the *Atlantic Clippers*. . . . Test Pilot Eddie Allen says that with this tab arrangement no mechanical assistance is needed to use the ailerons, rudder or flippers . . . a pilot can control the big planes with one finger . . . but the **Douglas** company thinks otherwise . . . the DC-4 right now is having a dual motor driven control system installed . . . the pilot, in using the controls, merely starts a motor that actually causes the ailerons to move against the air-stream . . . like motor-boosted brakes on a motor car . . . **Douglas** says that for big airplanes auxiliary power is needed to help the pilots . . . probably both companies are right . . . we just thought you'd like to know.

* * *

Frankly the **All-American Air Maneuvers** were lousy . . . the show was made and sustained by the boys and girls, men and women who gathered from as far as Canada to the north and Nebraska to the west in their *Cubs*, Taylorcraft, Aeroncas, etc., for the lightplane cruise . . . the newspaper correspondents told the story when they reported that the gathering at **Miami** was the largest—in number of planes—in aviation's history . . . *there were* 487 airplanes on **Miami** airport one day of the meet by actual count . . . of this number 325 were in the lightplane class.

But for an aviation meet there was little to recommend the gathering . . . the speeds at the races were hardly representative of even moderate priced private planes—something like 176 m.p.h. for a 25 mile race was tops . . . in fact those who attended agreed the maneuvers hardly had anything to offer to the general public.

For pilots there was great interest in watching the stunting of *Cubs* and Aeroncas . . . one boy from South Carolina did slow rolls, an outside loop and inverted flying in a *Cub* . . . believe it or not! . . .

* * *

Item from Germany: a special kind of synthetic fuel for aviation motors has been developed by German chemists . . . it is injected into motors in solid form, not as a vapor in which there is a large percentage of air . . . it is economical and is said to free Germany from the need for large petroleum fields and oil reserves and is supposed to give power as well as normal fuels in the 87 to 92 octane class . . .

* * *

Odds and Ends . . . it's said the **Aeronautical Chamber of Commerce** is due for a shakeup . . . **Charles Horner**, NAA prexy, is about to get a high Washington post . . . in about two months . . . the Army's newest secret **Douglas** "tricycle" bomber can fly non-stop from Texas to Panama and back . . . carrying a full military load and crew of three . . . leave it to the **British**: those 200 American bombers they bought will be known as **Lockheed** *Hudsons*, instead of "14" . . .

END

Solution?

Sirs:

I should like to submit a caption concerning the picture of the Curtiss F-11C fighter which appears on page 40 of your February issue. I believe this to be the same ship that Herr Ernst Udet acquired as a sport plane. It was especially modified for his . . . arcrobatic displays and first appeared . . . at Tempelhof aerodrome on Easter Sunday, 1934.

BOB CUNNINGHAM.

London, Ontario, Canada.

Rankin Bouquet

Sirs:

A thousand thanks to POPULAR AVIATION for the publishing of Tex Rankin's article, "You Can't Get Away With It!" I've read the article three times and intend reading it again until I have thoroughly acquainted myself with its contents . . . It is articles such as this that contribute immeasurably to safety in flying, particularly to flyers who are unable to attend an accredited flying school; flyers whose only information is gleaned from a very few texts, the advice of an instructor and a possible hurried reading of POPULAR AVIATION . . . There are thousands of young men and women in the United States today who are learning to fly . . . young men and women whose only turn-and-bank indicator is the seat of their respective pants . . . they've sold their hogs, mortgaged their cars and even sacrificed their best girls to learn to fly and most of them are doing a darned good job of it. So for an article like "You Can't Get Away With It!" goes, for myself at least, a "thank you" . . .

CHARLES S. FINCH.

Carlisle, Indiana.

Sirs:

. . . I am especially enthused with Mr. Rankin's article and, as far as I am concerned, it is the most informative article I ever read in any text or publication. If I knew Mr. Rankin's address I would certainly write him, expressing my gratitude for such valuable information for the private flyer . . . I think you should encourage Mr. Rankin to give us more of the real "meat" of his knowledge of flying. No doubt this one article . . . will be the direct cause of saving life and property and, while I have only about ten hours solo, the idea brought out about the effect of centrifugal force and its effect on the stalling speed and applied to loops, turns, etc., has caused me to much improve my air work already. I hope to see many more of such valuable articles . . .

T. C. RAYNES.

Braman, Oklahoma.

• Our thanks to Readers Finch and Raynes and the many others who have expressed great enthusiasm over Mr. Rankin's article. Their Rankin appetites will be further sated by his second article in this issue. Others will follow in the near future.—Ed.

Saps

Sirs:

. . . Your article in the February issue entitled "Strike!" . . . got on my nerves . . . the flyers who did the dirty work for Tom Girdler and Republic Steel get my most serious wording as "saps" and as usual they are the "student type" who do not know what it means to slave for Big Corporations . . . I always took that P. A. was for the small operator, men who cannot get in with the big shots.

FRANK E. BILTONEN.

Sudbury, Ontario, Canada.

• Reader Biltonen takes his class-distinction too seriously. POPULAR AVIATION simply reported an interesting story and will continue to do so in the future.—Ed.

Transatlantic Feud

Sirs:

With reference to . . . "This Transatlantic Poker Game" I do not intend to take part in this discussion as I am afraid my knowledge of the situation is not very great. However, you will by this time, have received definite information that our G class Empire boats are actually flying and some have started on special service in connection with moving the Christmas mail on the Empire routes. . . One of these boats, the Imperial Cabot, was earmarked to make some transatlantic flights this past Fall but unfortunately they had to be postponed due to the international crisis. Now that this is over, different arrangements had to be made because of the approaching busy Christmas season.

PAUL E. BEWSHEA,
Commercial Manager.
Imperial Airways, Ltd.
New York, N. Y.

Sirs:

. . . That (Royal Air Force) bomber flight to Australia (recently) sort of bears out my criticism of the composite aircraft, doesn't it? If they could take off unassisted and fly 7,100 miles, why the ---- is (Imperial Airways) fooling around with an expensive, unwieldly composite job that won't come within a thousand miles of that record? . . .

JOHN C. A. WATKINS.

Baltimore, Maryland.

• Author Watkins' remarks concerning the Mayo composite aircraft have been voiced by several veteran aviation men, including a few able British airmen who have been closely connected with the project.—Ed.

Gliders

Sirs:

. . . I have decided I would like to build a sailplane . . . Upon seeing an article on gliding in POPULAR AVIATION I thought that you could possibly help me in the matter of securing a good, reliable plan . . .

JOHN L. SPRY.

Punchbowl, N.S.W., Australia.

• Gliding and soaring enthusiasts will save themselves time by requesting such aid from the Soaring Society of America, 1500 Locust St., Philadelphia, Pennsylvania. We cannot possibly maintain a clearing house on this particular phase of aviation. —Ed.

END

PLANE FISH-ERMEN

by GEORGE H. DACY

This is the story of a fishing trip as we'd all love to have it. You might get a few pointers.

SEEMINGLY it would be most appropriate if flying fishermen fished exclusively for flying fish. But in reality there is no limit to the kind and variety of finny treasure which aviation anglers yank from the deep sea or inland lake or river. For they sing a song something to the effect of "what difference distance?" The space-annihilating amphibian doesn't effectuate the presence of the piscatorial princes in two or three places at once but it comes unpleasantly close to turning that trick. Fellows who fly to their fishing grounds can visit a half dozen different sites where the big 'uns usually strike in the same time that it takes their mates who travel by boat or motor car to arrive at and appraise the fishing possibilities of but a single angling ground—better say water.

There are some handicaps associated with amphibian angling; however the supreme distance-covering feature of this latest style of fishing greatly overbalances any such shortcomings. Interrogate Don McCarty, secretary of the eminent Rod and Reel Club of Miami Beach, Florida, or John Larrimore of Miami, ardent fishing fan, if you doubt what your correspondent writes about fishing from a cloud cruiser. Both these angling enthusiasts are busy men; they can only devote a few hours at a time to the outdoor sport which they love so well. Usually a flying boat as a fishing craft enables them to make the most of their limited vacation fishing hours.

The good fishing off the south Florida coast usually is had in the Gulf Stream, near the Florida keys or over the indescribably beautiful coral rock reefs. Those grounds are from 30 to 40 miles from the Miami fishing wharves; it usually takes one or two hours by fishing boat to reach the spots where the game fish hunger for choice bait. That means that the out and in trips require from three to four hours. Add at least a similar time elapse for the actual angling and you have another day gone. If on the other hand the anglers aspire to motor to the popular fishing lanes below Tavennir and down towards Cape Sable they have a drive of 75 miles on their hands before they reach salt water. Then they have to transfer tackle, dunnage, and provisions to a boat and put in another half hour or more of water travel before they loose their first casts of the day. If instead of motoring to the keys they elect to visit Everglades City or Naples they must travel 75 to 105 miles by land across the southern Florida peninsula before they arrive at the Mexican Gulf where they can charter a fishing boat.

If you're an amphibian owner or if you team up with a couple of pals and charter a seaplane for your fishing all the worries and hurries of land travel exit from the picture from the very take-off. Messers. McCarty and Larrimore for example spend no more than 15 minutes in flying out to the select Gulf Stream sites where a seasoned hook and liner is apt to bait and boat—or rather amphibian—anything from a 40-pound grouper, 60-pound sailfish, 50 pounds of fierce fighting barracuda or a marlin or tuna as big as a small Shetland pony. If the first site is not productive of prompt "strikes" the birdman lifts his plane for a try another place possibly five or ten miles farther south. If the fish aren't biting at the second "stand" the maneuver is repeated. The party continues to fly, land, and cast

Two aerial fishermen set out for a flight. Larrimore (below) gets a strike and reels in.

Larrimore lands the first fish while McCarthy (right) casts for his first.

until the rodmen locate a satisfactory spot where the game fish display an appetite for cut fish served on hooks. Then the anglers, from perches on the hull or wings of the floating amphibian, match their skill against that of the finny swimmers. The contest between the takers and evaders continues until the sportsmen have filled their creels or the decision of the clock hastens their homeward flight. Two and one-half hours total elapsed time and the fun-loving fishermen are back again at their desks; nobody even suspects that they have journeyed away out to the Gulf Stream, "flying-boated" plenty of hard-fighting fish, and returned to their offices in such an amazingly short interval. That is the pristine contribution of the modern amphibian or seaplane to the exciting sport of game fishing, especially when business tries to toss a monkey wrench into the pastiming engagements of the business executive or professional man.

The seaplane as a vehicle to convey you to your angling rendezvous offers another possibility. The fishermen who can spare but limited time from their business duties may arrange with friends for a meeting at a certain fishing grounds at an appointed hour. The more leisurely anglers can proceed to that spot by fishing boat. Those to whom time means money may start several hours later, fly by amphibian to that spot, transfer to the boat, fish with their companions for an hour or so and then use the seaplane as a means of speedy transport back to the city where business dates, conferences and board meetings await them. Men of affairs who live in seaside cities may dedicate their luncheon hours to such new-record fishing trips.

Just another example of what Florida offers to flying fishermen: Florida is speckled with some 30,000 small lakes, large rivers, and their tributaries. And anyone that thinks the fishing in these interior bodies of water does not offer rare sport simply is not familiar with our southernmost state. Fishing is superlatively fine in these interior waters; catches of black bass for example that weight from three or four up to 10 to 12 pounds or more per fish are common. And the fish usually bite like there was no natural food left in the waters which they inhabit.

It is only natural, then, that the airplane would fit into this picture admirably. Not only is Florida and its surrounding fishing grounds ideal for the amphibian or flying boat; such far off places as central and northern Canada also are especially suited for this type of fishing. In Canada, for instance, the flying fisherman can fly up to any one of hundreds of ice cold fresh water lakes—many of them have never been charted—and spend a thrilling week-end getting his fill of trout, bass, pike, pickerel and muskellunge. To the seaplane these lakes are no more difficult to get into than a large airport for a landplane. To reach them overland, though, would be an almost impossible task. Florida is more accessible to the landsman.

When fishing in the Gulf Stream, along the Florida keys, amidst the Ten Thousand Islands on the west coast and in the Mexican Gulf is poor, the amphibian-riding anglers can fly inland to mighty Lake Okeechobee and many of the other popular interior waters which dot 'gatorland and enjoy good fishing. Riding the skyways and air lanes enables the most progressive stylists in angling to make the round of a dozen or more of these lakes in a half day, covering possibly several hundred miles and yanking some good food fish from each waterway. That is a new and novel experience in the history of American sport fishing. If you doubt that it has some spectacular thrills to offer just try it and revise your opinion. Take it from your writer you'll experience some rare fun, something to tell the grandchildren about when you grow old.

END

High Speed Airliners

NEW airliners, capable of maximum level speeds of nearly 300 m.p.h. and built for passenger transport in the attenuated air of the great heights, are on order by the Air Ministry from the Fairey company, constructors of the *Battle* bomber which now is in large production for the Royal Air Force.

Models of the new transports have been tested in the new Fairey wind-tunnel, a giant structure housed in a special building at the company's factory at Hayes, near London. This is the largest privately owned wind-tunnel in the world. There the research workers have obtained data for the basic design of the new aircraft, which will be four-engined low-wing monoplanes built entirely of metal to the "stressed-skin" formula, in which the external coverings of wings and fuselage carry much of the loads and stresses imposed on the structure in flight. Power will be supplied by four 1,000 h.p. engines, each driving an American constant-speed controllable-pitch propeller.

Country Gals

SIXTY-TWO of United Air Lines 140 stewardesses come from "the country" towns under 3,000 population it has been discovered. Apparently the small town girl who enters nurses training and is ambitious and willing to learn, is an ideal type for stewardess on the airlines.

Some of the towns represented on the roll includes: Lapwai, Idaho; Pierz, Minn.; Celina, Ohio; Hell's Canyon, Montana; Valencia, Kansas; Brush, Colorado (the girl from this town is Alice Razor!); Petersburg, Alaska; Yoncella, Oregon; Soldier Summit, Utah; Brighton, Iowa; Tonganoxie, Kansas, and Wamego, Kansas.

No Snitching!

OFFICIALS of the Civil Aeronautics Authority recently got through a new regulation designed to prevent representatives of that organization from "telling tales out of school". Designated as "Regulation 205-A-2", it announces that "information or documents obtained by officers or employees of the Authority in the course of any examination, study or investigation pursuant to the Act, shall, unless made a matter of public record, be deemed confidential. Officers and employees are hereby prohibited for making such confidential information or documents available to anyone other than a member, officer or employee of the Authority, unless the Authority authorizes the disclosure of such information or production of such documents. . ."

At right are a few Wiggins employes beside a Waco "N" belonging to their company.

E. W. Wiggins

MR. WIGGINS SELLS 'EM

by KEN DRONN

When a man retires after a successful business career, you'd think he'd stay put. This one didn't.

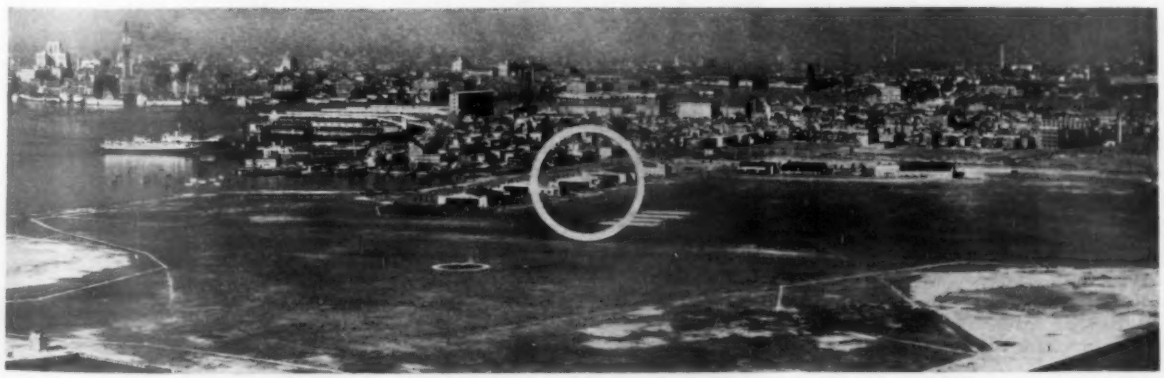
THE Fitchburg-Leominster airport serves two of Massachusetts leading industrial cities. It is nestled between two low, rolling hills that stretch to the west, rolling higher and higher to form the majestic Berkshires that frame the famous Mohawk Trail. At 52, just returned from vacation trip to Europe, Elmer W. Wiggins drove to the Fitchburg airport one sunny afternoon in 1930. Officially Wiggins had retired from active business at 52, having completed a successful career in chemistry. But that afternoon was born within him an enthusiasm, a vitality, a courage he had not known before—the love of aviation. People snickered behind his back when he decided to learn to fly. What did a man of 52 years want to learn to fly for, they asked.

But these few doubting Thomases hadn't reckoned on the fearless, hard-headed business man who—though officially retired—decided to take a specified sum from his life's earnings and put it into aviation. Thus, in Fitchburg, Mass., eight short years ago, was born E. W. Wiggins Airways. The company consisted of one pilot and one airplane—a Spartan biplane that today still is in fine condition and sees daily service at one of the four Wiggins Airways bases—the Rhode Island State airport, serving Providence; the base at Newport, R. I., the Norwood, Mass., airport and the richest, most potent of Wiggins' aeronautical assets, the base at the Boston's municipal airport.

More youthful and energetic than he was eight years ago, Wiggins is now in his 60th year, a dominating figure, a legend of New England aviation, a man who has done more than any other one to unify aviation interest and enthusiasm in the six New England states. Slight of stature, his wind-burned face always wreathed in a smile, Wiggins has an average business day that is likely to take him to most any corner of New England—thanks to the fleetness of his 330 h.p. Beechcraft.

Despite the large sales force he has gathered about him, Wiggins is by far the best salesman of his company—it's not unusual for him to sell ten of Bill Piper's *Cubs* in a month. In 1939 he probably will sell nearly a hundred of the hundreds of *Cubs* that first see the light of day at Lock Haven, Pa. With a total of 12 pilots, Wiggins has a fleet of 33 planes, 13 of these being cabin jobs for sight-seeing and charter work. His fleet outnumbers that of many airlines and is equalled by no non-scheduled operator in the United States. His vast organization represents Beech, Waco and Piper for most of New England. A twin-engined Beechcraft is the pride of the Wiggins fleet—though shrewd business man Wiggins made sure that the ship was subscribed to for 1,000 hours annually before writing his check for beaming Walter Beech. Governors of most of the New England states and countless other dignitaries have been air-born aboard the twin-engined Beech.

Boston's municipal airport is an ideal operations base for private operators as well as airlines. Wiggins Airways (hanger in circle) use Boston as its headquarters and has three other branch bases.



Protege and intimate friend of Wiggins is blonde and affable Charles Cowan, now chief pilot of E. W. Wiggins Airways. Cowan does much of the high speed flying and is all but married to the twin-engined job. Proudest triumph of Cowan so far this year was to outdo airline schedules on a recent non-stop flight from Chicago to New York when the "ole girl" covered the 712 mile airway in less than three hours and a half Not a record, to be sure, but plenty good enough for a Wiggins pilot and a Wiggins plane.

Wiggins points with pride to two things—the speed and safety of his airplanes and his high standard of maintenance. E. W., as he is known throughout the aviation industry, has hired some of the country's most skilled mechanics. His theory is "I don't give a damn how much it costs—what I want is to eliminate motor failures or any sort of mechanical trouble with our planes."

That theory has yielded a splendid harvest. His student business has increased tremendously in the past two years. From his Boston base, scores of college students, many attending Harvard, fly regularly. His volume of charter business sets the pace, not only for New England, but for the rest of the country as well. Thousands upon thousands of New Englanders have taken their first airplane rides in Wiggins' ships. During the summer months some of his ships are placed on floats and are operated from lakes in New Hampshire and Maine.

Every two days Wiggins makes it a point to visit each of his four bases—always by plane, of course. From Providence, where he makes his home, he makes the circuit to Newport, Norwood and Boston within the space of four or five hours. His Boston manager, Ben Follett first joined the Wiggins organization as a pilot several years ago. To Follett's office every Thursday morning go the entire Boston personnel for a round-table discussion. Wiggins has never tolerated politics within his organization and all difficulties, large and small, are ironed out on Thursday mornings. Both Wiggins and Follett urge their employees to fly as much as possible. Mechanics and helpers get into the air at regular intervals. A comprehensive educational program amongst his pilots was launched a few years ago. Each pilot is required to put in a certain amount of instrument time each month.

One of the chief spark plugs in the company is Miss Miriam Vanderslice who soloed a few years ago and became actively engaged in fixed base operations by her association with the late John H. Shobe and Shobe Airlines. After Shobe's death, Wiggins took over the Shobe hangar and operation and convinced Miss Vanderslice that she should continue as Follett's assistant. She owns a Fleet biplane that sees much service during lunch hours and on Saturdays and Sundays.

When he made his first solo flight eight years ago, Wiggins was one of the

(*Continued on page 76*)

We Told You So . . .

WE have been championing the safety of modern private flying for years and now have found someone else who isn't doing a bad job at all. Whoever this enterprising airman is, POPULAR AVIATION's correspondent wasn't able to tell us. But the fellow who hung that sign on the car deserves some sort of medal.

The site is near Lancaster, Pennsylvania, where the automobile in the picture met with a somewhat devastating accident. It so happened that the accident occurred near Lancaster's airport. The car was so completely liquidated that a few gleeful airmen at that field took advantage of the situation. You see the results above. They tell us that the stunt helped business out at the airport.

New Engine Tester

PROOF that the Wright Aeronautical Corporation is planning on air-cooled radial engines up to 3,000 h.p. is evidenced by a series of 14 engine testing cells recently completed at the Wright factory in Paterson, N. J. The photograph below is of one of the test cells' control rooms.

Four of these new cells already are in use. Several others are nearing completion and will be placed in operation as soon as finished. They are used solely for the purpose of carrying out final tests on engines being built on a production basis and are not for experimental development. Of particular interest in connection with these cells are the provisions that have been made for the simulation of practically any condition that an engine might encounter in actual flight. A blower connected to the carburetor air intake, for instance, enables engineers to duplicate the "ramming" effect of air entering the carburetor at 200 m.p.h. This blower also is equipped with controls that will "thin" the air being fed to the carburetor.

The test cells are built in pairs, separated by a control room like that shown below. On each side of the control room are tables and panels on which are mounted the throttled and various instruments with which the engines are checked for power output, fuel and oil consumption, cooling and other functions. A clear glass window above the instrument panel gives the test observer a clear view of the cell and engine.

ICE!

by ABBOT MacDONALD

Airmen have had a deadly fear of ice ever since the beginning of "weather" flying. It is a fear that is well founded.

WINTERTIME, with its ice and snow, is a source of joy to every youngster. Nature herself has provided new toys to play with, new means for enjoyment, and the thrills associated with snowballing, ice-skating, and sliding are never forgotten elements of childhood.

But the pilots who fly in winter weather occasionally experience an entirely different kind of thrill—the thrill born of Nature's own capriciousness in causing ice to appear where it is least desired—on the wings of an airplane. Ice itself is one of the most capricious of Nature's children. Under some circumstances it will form on airplane wings and control surfaces in such small quantities as to be as harmless as an ice cube, but under certain other conditions favorable to its growth ice will change the shape of an airfoil so swiftly—right before your eyes—that a forced landing or even a parachute jump may be the only alternative.

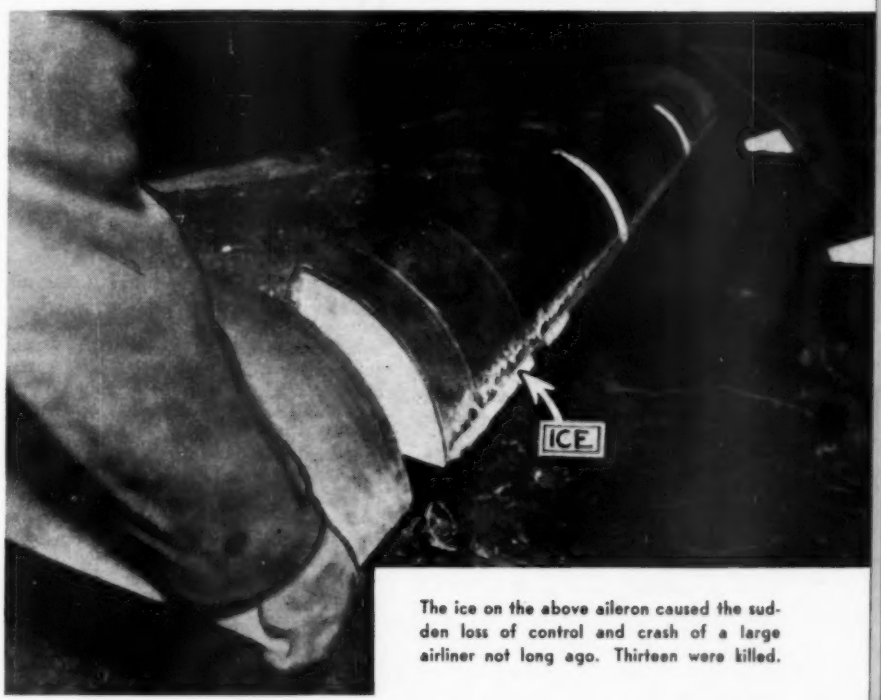
There is no reason, however, why an airman should fear this special hazard of winter flying. That is, not if he understands it, knows its possibilities, the conditions under which it will form, and knows where it may be found. Knowing this, ice may be avoided by simply steering clear of it. Now the kind of ice that forms on an airfoil and the kind of ice you put in iced tea are sisters under the skin, but, like Judy O'Grady and the Colonel's lady (apologies to Kipling), the resemblance ends there. In the order of flying-hazard involved, the various kinds of aircraft ice are: *Clear Ice* (sometimes called *Glaze*), *Rime*, and *Frost*. In order that you may recognize these three villians if you should ever happen to encounter them their descriptions are as follows:

Clear Ice.—The most dangerous character of all. Normally smooth and glassy in appearance but it becomes very rough and treacherous if it forms in the presence of sleet and snow. At its worst, it forms in an irregular, mushroom shaped mass near the leading edges of wing and control surfaces at about the point of maximum camber. Since this point is usually aft of deicing equipment, such equipment is only about 50 per cent effective in preventing large deposits of clear ice. It clings tenaciously to any surface on which it forms and is almost impossible to break loose. After picking up a moderate dose of clear ice the airplane will usually start vibrating badly. In this case you should either seek warmer air where the ice will melt off, or cold dry air in which it will evaporate. Yes, ice can *evaporate!*

Rime.—A white, opaque ice which forms in a granular, sharp-nosed deposit along entering edges of the airplane structure. Rime is not particularly dangerous under normal conditions since it will not materially alter the aerodynamic shape of wings and control surfaces. Due to its granular composition it possesses little tenacity and chunks of it are constantly lost due to normal vibration of the airplane. The formation of dangerously large deposits of rime ice is therefore unusual—but sometimes quite possible.

Frost.—The least dangerous (relatively speaking) ice of all. It is a crystalline ice structure which forms more or less lightly on an airplane when left outdoors on clear, cold nights. It may form in flight when an airplane emerges from a cold layer of air and enters air of higher temperature and moisture content. In this case it will usually disappear as soon as the airplane attains the same temperature as the air through which it is flying. Although frost is normally of small hazard, Alaskan pilots have reported rapid frost formations during take-off in such quantities as to cause them to lose control of the airplane shortly after leaving the ground. Play safe and remove all frost (and snow) from your wings and control surfaces before taking off.

You will find it quite easy to avoid any contact with rime or clear ice if you will just remember these two simple (and logical) facts.



The ice on the above aileron caused the sudden loss of control and crash of a large airliner not long ago. Thirteen were killed.

First: Ice cannot form unless *visible moisture* is present in the atmosphere. That is, moisture such as clouds, fog, or rain must be present in the air through which your airplane is flying.

Second: The temperature of the air surrounding the airplane must be less than +2° Centigrade (about 36° Fahrenheit). This is a fairly conservative upper temperature limit.

It is important that *both* of these conditions exist simultaneously at the particular place in the earth's atmosphere in which you are flying. Thus, the ground temperature may be well above freezing, yet at 3,000 feet severe icing conditions may exist. As a matter of fact, sufficient clear ice has been encountered on a *summer day* while flying in a cumulus cloud at about 12,000 feet to cause the pilot to lose control of his airplane!

The formation of aircraft ice of any type depends upon the existence in the atmosphere of minute droplets of water which are undercooled to temperatures below freezing. "Unbelievable!", you may

say; but nevertheless, it is a fact that particles of *water* can exist in a wet *unfrozen* state at temperatures *well below freezing.* The precise reasons for undercooling have been the subject of considerable scientific speculation and controversy which does not concern us—just accept undercooling as a fact.

Undercooled water droplets possess a most amazing property, for as soon as the droplet is suddenly disturbed, as by striking an airplane for example, a part of the droplet is converted almost immediately to ice. The *quantity* of each droplet thus converted to ice depends upon the degree of undercooling and the size of the droplet. At very cold temperatures almost all of a small cloud droplet may freeze at the instant of collison with an airplane. Under these conditions rime ice would form. Careful study of icing reports by pilots has resulted in the following conclusions in regard to rime:

(1) Rime forms more frequently in the types of clouds found within cold air masses than in warm air mass clouds. Cold air-mass clouds are usually of the stratus, strato-cumulus, alto-cumulus and small cumulus types. Convection and turbulence within these clouds are usually slight and hence the size of water particles supported in them will be *small.* Also, the colder the air, the smaller its capacity for holding moisture. Consequently cold air mass clouds will be composed of small and thinly dispersed water droplets and the clouds will be relatively "dry". (2) Rime will ordinarily predominate at temperatures of —8° Centigrade (about 18° Fahrenheit) or *lower.*

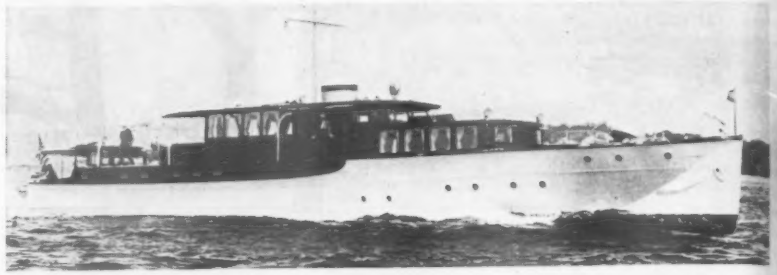
Clear ice forms under conditions quite different from those described above. When the cloud particles are large and temperatures are between about —8 and +2 degrees Centigrade only a small portion of each undercooled particle will freeze immediately upon striking the airplane surface. Now the fundamental laws of physics cannot be denied and the resulting mixture of ice and water immediately assumes a temperature of zero degrees Centigrade (the freezing point). This phenomenon will take place irregardless of how cold the under-cooled droplet may have been before striking the airplane.

The droplet after striking the airplane will then consist of two components: (1) ice, (2) water at the freezing temperature but still unfrozen (let's just refer to this component in future discussions as "remaining water"). The severity of the clear ice formation depends almost entirely on how much time is required for complete freezing of the "remaining water" component. If conditions are such that the "remaining water" freezes fairly rapidly it will not have much opportunity to spread out and become distributed by the force of the airstream. In this case each droplet striking the airplane will become partially frozen at the instant of impact, the "remaining water" will spread a little and soon the entire droplet becomes a glassy "spot" of ice.

As each new droplet forms on top of the preceding droplet, a sort of a ridge

(*Continued on page* 85)

Yacht for Martin's "Navy"



The "Glenmar" will be used both as a floating laboratory and pleasure yacht.

GLENN L. MARTIN'S plans to build huge flying boats on a major scale during the next few years have been indicated recently by the arrival at his Baltimore plant of a luxurious seagoing yacht which will be used in the tests of the aircraft.

To serve as a floating platform for the engineers and others who must witness tests which determine the handling characteristics of the airplanes on the surface, Martin has purchased the 85 ton *Margaret F. III* from Lawrence P. Fisher, president of the Cadillac Motor Company.

One of the fastest and most luxurious craft of her type afloat, the yacht, which will be rechristened the *Glenmar,* was built *ten* years ago by John H. Wells, Inc., of New York City. A sister craft, the *Lura M. IV,* was built at the same time for the automobile manufacturer's brother.

The *Glenmar* is 106 feet long, with a beam of 16 feet and a double-planked cedar and pine hull. She is driven at from 16 to 17 miles an hour by two 200 h.p. Winston Diesel six-cylinder engines, with electricity being generated by a Winton-Junkers Diesel and Winton gas engine.

Mr. Martin explained that in addition to using the craft for test work, it will serve also for pleasure trips on the Chesapeake Bay. It is well-equipped for this purpose, having owner's quarters with a double stateroom, dressing room and bath (for guests, there is one bath with tub and another with shower) and, altogether, sleeping accomodations for seven in addition to quarters for a rather large crew.

The pioneer manufacturer's business is booming. His plant is being operated in two shifts at the present time, putting out bombers for export and, it is believed but not confirmed by the company, completing an order from the Navy for twin-engined patrol boats. These flying boats will be tested next spring, it is understood.

Martin also is expected to receive a considerable share of the business which will result from the rearmament program announced recently by the President, and in addition it is considered likely that when American Export Airlines is ready to start transatlantic passenger service, the equipment will be built by Martin.

James S. Eaton, vice president of American Export, and other officials of the company have conferred frequently in recent months with Martin, and it is known that he has plans ready for a flying boat larger than any ever built in this country, including the *Atlantic Clippers* built by Boeing for Pan American Airways.

Looking forward to his activity in the construction of water-based aircraft, Martin has also ordered a 38 foot crash boat, with a speed of thirty knots and complete fire-fighting and emergency equipment, from a yard in Annapolis, Md. Since all tests are conducted by the company on the Chesapeake Bay a few miles from the plant, and with flying boats being built in quantities, a Martin "navy" is not only desirable but absolutely vital.

Meanwhile, there is some speculation about the reported order the Martin company is said to have from the Navy. The rumor, at least, recalls the small "flying model" (shown below) that was publicized in POPULAR AVIATION early last year. At the time, this model was said to be a replica of the Navy design.

Is this one-man flying model the predecessor of a fleet of bombers for the Navy?

A leaky oil line during a stunt flight resulted in this complexion for Miss King.

AIR QUEEN

by F. LELAND ELAM

Here's a pilot for the girls to feel proud about. Bernadine Lewis King is an ace in her own right and competes with airmen to prove it.

A THOROUGHLY distinguished flyer of more than usual accomplishments—whose achievements and records stamp her as an unusual air queen—is Miss Bernadine Lewis King.

A typical Western girl, raised in the New Mexico Rockies, and known to many of her friends as "the flying cow girl" because of her interest in cattle and activity in taking part in round-ups when possible, saw her first airplane when she was eight years old. Aviation has been one of her main interests since that day.

In the early 1930's she decided aviation would be her career, and after passing her pilot tests before Department of Commerce Inspector Gene Scroggie, she set out to become a success as a pilot in business aviation and to make it pay her well.

During her flying career which has been crowded into an unbelievable brief period of years this young woman has flown over 1,000 certified hours and experienced a wide range of adventures and near catastrophies which rival fiction.

Today she is the only woman skywriter in the United States, an exceptional stunt exhibitionist, and the holder of upside down flying records. The different kinds of aviation work Miss King has done since she received her license in 1935, and the experiences she has had are amazing, and would fill a good-sized book if one were to tell about all of them. We will touch on but a few in the following paragraphs.

She has made 32 forced landings, approximately four times the number made by the average pilot, and she significantly attributes nearly every one of them—some of which were safe by a very narrow margin—to what she terms "unorthodox methods of flying—testing, stunting and dangerous aerobatic maneuvers."

It makes no difference to Miss King what she is doing as long as she is in the air. The air is her life. "I don't care if I am right side up or upside down, as long as I am upstairs," she told POPULAR AVIATION'S correspondent at her headquarters at 6272 Yucca Street, Hollywood. "It may be in either big planes or little ones. I do prefer being alone, and most all of my extra-long cross country trips have been alone. However, I have trained several students, and carried many other persons."

As a student she flew Wacos, Lincolns, J-5 Eaglerocks, and several other planes in short hops or longer ones with duals and a check pilot. She often sneaked aerobatics, having an aptitude for them. She took many long cross-country hops, and it was on her first of these, while still a student, that she had

Bernadine King makes a business of such hedge-hopping stunts as this.

her first experience that lives vividly in her memory.

She flew from Los Angeles to a destination north of Bishop in the high Sierra mountains. She returned to Los Angeles and was attempting to land at dusk, when a sudden twisting and apparently uncontrollable motion of the plane, kept her fighting to keep the ship from getting completely out of control and to keep it on its path of landing. She fought a man-sized job in her J-5 Eaglerock and landed successfully to discover a tire had blown out. A good beginning and unusual experience for a student on her first cross-country solo flight!

Immediately after receiving her private license she completed a three weeks "good will" tour of seven western states. Her tour, sponsored by the officials of the larger cities and California state officials, took her along one side of a state and down the other, never covering the same ground twice.

She was a guest of the many mayors of the principal cities of the west, the chambers of commerce, 26 sheriffs, and 26 chiefs of police. She was honored and entertained by seven governors and other state officials. Miss King naturally derived a great deal of flying experience from this tour as it took her into airports of high altitude and low altitude. Also it was made in the month of January, when bad weather including snow, rain, hail, strong winds and fog were prevalent.

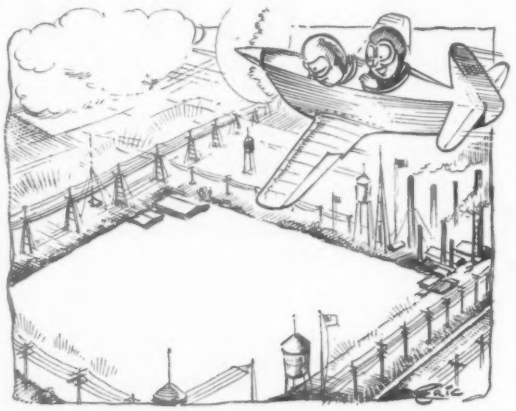
Undoubtedly her most unusual feats are two upside down flights, one between Caliente, Mexico, and San Diego; the second between Bellingham, Washington, and Vancouver, British Columbia, thus crossing both international borders of the United States. She established the first official world record for women for upside down flying with a time of 25 minutes and 26 seconds. Her present record stands at two hours and five minutes.

She has had many interesting experiences while in inverted flight. Once while going cross-country—right-side up—over the mountains to the East of Santa Barbara, the oil pressure dropped to zero. There was no place to land. It looked like she would have to fly back to the airport from where she started—or go on to her destination—but by that time the engine would be ruined.

Miss King called on her inverted flying experience for the one way which might solve the problem. Bernadine rolled the plane over in a one-half roll onto its back. As she hoped the oil pressure came back to normal, so she flew inverted. She navigated over the mountains and the San Fernando Valley to Union Air Terminal, where she one-half rolled over to right side up position and landed. At the time a Department of Commerce inspector was on an inspection tour and followed her in—not knowing at the time the reason for the inverted flying. He later congratulated her.

Miss King took personal charge of changing a standard Fleet, extra heavy model, into a plane in which she could fly inverted and do smoke writing. She installed a Kinner 165 h.p. engine. This demanded a change in the motor mount, and it automatically changed the center of gravity. Bernardine took out the front seat and used the space for extra tanks for chemicals, oil and gas for both right side up, inverted flight and smoke writing. The ship is equipped to fly 5½ hours inverted.

She inserted ailerons and rudder tabs, special exhaust manifold, stack for "smoke" equipment, and extra control valves including a chemical tank pump which is manually operated from the rear cockpit. The motor is specially equipped with proper pumps to keep oil in the engine and working while in inverted flight. Occasionally, when something goes wrong, she receives a oil or gasoline bath.



"It isn't on the map but it's a typical airport, all right!"

Miss King did all her own testing of the equipment and special hookups, it often taking several days to test and perfect some detail. Three months of testing was the actual time required to get the ship to perform as she desired.

It was while testing a special inverted hookup over San Fernando Valley that Miss King had her narrowest escape. The ship went accidentally into an inverted power spin at 3,500 feet. For almost 2,500 feet the plane spun rapidly out of control and nothing she could do would control it. Finally giving up in despair she let go of the stick and prepared to use her parachute. Hating to lose the plane she took the stick for one last try at controlling it. The plane responded and she eventually landed safely. The loss of control of the plane she says was due to carelessness while making a certain maneuver.

At first Miss King had no intentions of specializing in aerobatics, but she did want to perfect precision maneuvers. She finally became so interested in this type of variation that she made aerobatics part of her professional aerial program.

She has been referred to as one of the world's greatest aerobatic pilots. Amelia Earhardt once said she considered Miss King the best feminine acrobatic flyer and "tops" in inverted flight. Wiley Post said he believed her to be the best all-around woman pilot whose flying technique could compare with the best of men.

At no time has Miss King felt that she was so good that she could not make a mistake. "I'm not kidding myself any," she said. "I think I am good to a certain extent, but not too good. I can make mistakes, and my equipment can fail. When a flyer gets to the point where he thinks he is too good—watch out! He is dangerous. At each performance or exhibition on my low flying acrobatic act, I watch each slight movement every split second. I am flying my ship—it is not flying me. I truly love my aerobatic work. It has given me a greater appreciation of the elements and equipment."

Listed among her maneuvers are just about every movement of the plane that is in the books. The real daring aerobatic stunts take place close to the ground. One of these is picking up a handkerchief from ground by wing-tip. She does one-wheel landings and take-offs. She can take a plane off from a moving automobile. For this she uses an Aeronca or *Cub*.

In another stunt she drops her landing gear and lands on the belly of the ship. Scooters similar to water floats are placed on ends of the wings to keep from digging them into the ground and causing serious damage. She jumps a plane over a car or small building about the size of a car, then lands dead stick. Strings are tied at certain points across runways so she will not misjudge the distance.

On all aerobatic flights, Miss King plans maneuvers in proper succession, and the minimum altitude for working. She does not vary from that while upstairs. If she loses altitude for some reason, she climbs back up to the altitude where that particular maneuver belongs. She attempts to plan out all causes for possible failure, and how to get out of them, such as the effect of strong wind on a low slow roll and what difficulties might arise; or what a gust of wind would do to the plane on a dead stick one-wheel landing, and how she can control the situation.

In her capacity as a smoke writer she uses smoke as a publicity and advertising medium. She has also used it on occasions to signal police and rescue crews at work on the ground. She has signaled forest rangers with smoke of starting of forest fires which she discovered while flying over mountainous areas. She uses smoke to trail all aerobatic stunts.

Miss King has been on wild horse round-ups and used her plane on them

(*Continued on page* 84)

A NEW BRITISHER
This is the first test flight photograph of the new DeHavilland Flamingo 20-passenger transport.

Lt.-Comm. George Noville, famed antarctic airman, is new California air school head.

Igor Sikorsky, prominent manufacturer, recently returned from European tour.

Prof. A. V. de Forest of M.I.T. has received 1938 Reed award for air engineering.

Personalities

It's Douglas Corrigan, star of "The Flying Irishman", now. He is shown at his Hollywood studio getting "retouched".

World's youngest air traveler is 13-day-old Bill Bangs, Mrs. Bangs is shown introducing him to his older brother, Charles.

G. P. Putnam recently heard his wife, Amelia Earhart, declared "officially dead".

Capt. A. S. Wilcockson has been named manager of Imperial Airways' Atlantic division.

J. B. Walker, former TWA vice-president, is now traffic manager for United Air Lines.

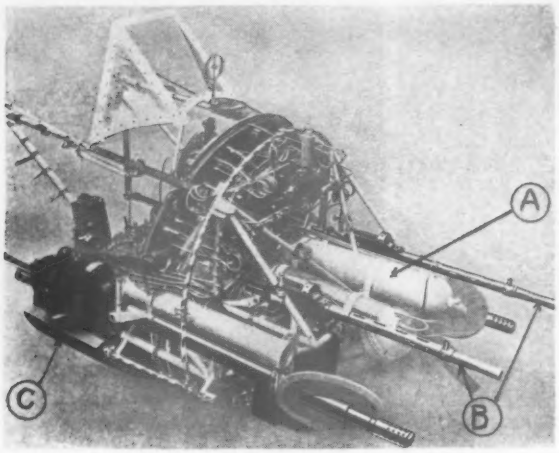
T. E. Johnson, Australian air engineer, recently ended a year's visit in the U. S.

Though both his legs have been amputated below the knees, George Copping of Seattle recently soloed after four hours.

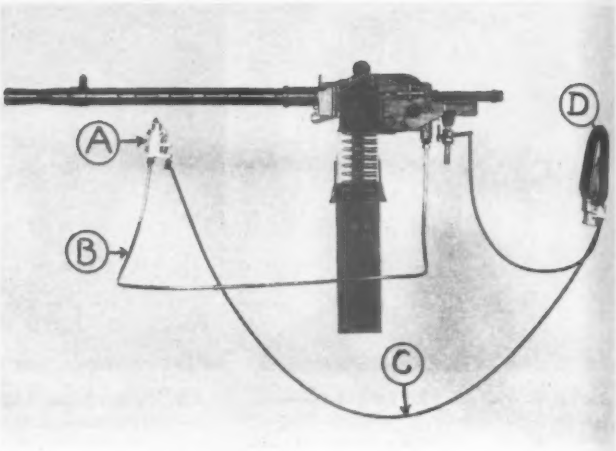
Gail Northe, air-minded representative of a Texas radio chain, actually is sister of C. R. Smith, airline head.

Above are Mr. (right) and Mrs. Bill Beattie at a recent party for Braniff Airways people.

K. D. Parmentier, famed Dutch airline pilot, recently inspected and flew the Douglas DC-4.



1 The Madsen cannon above is mounted on the potent Fokker G-1 attack bomber. A is the pneumatic tank used to automatically load the two weapons. B shows two smaller guns of 7.9 mm. (about .30 caliber) similar to American aircraft machine guns. C shows a full view of a 23 mm. aerial cannon mounted conveniently near the pilot's knee.



2 This is the fixed version of the 23 mm. air cannon showing details of the hydraulic synchronizer gear. A is the impulse motor connected and timed with the propeller. B is the main pressure line leading to the trigger-tripping gear. C is the secondary pipe line from the oil container through the impulse motor. D is the oil supply container.

CANNON IN THE AIR

by LIEUT. A. G. J. WHITEHOUSE

While Uncle Sam's military air services continue to seek a successful cannon for aircraft, the famous Danish Madsen concern has perfected this deadly gun.

IN the February, 1938, issue of POPULAR AVIATION I presented an article bearing the title "Guns in the Skies" in which I attempted to outline the progress of air armament from the old orange crate era up until the appearance of the Boeing bomber, now commonly known as the *Flying Fortress*.

This article also contained a somewhat incomplete résumé of the history of higher calibered weapons as they apply to fighting aircraft. I also endeavored to define two schools of thought in regard to aircraft armament, explaining that one school leans toward the use of two or more .30 or .50 caliber machine guns, whereas the other faction stands pat on one or more higher calibered weapons, now generally accepted as air cannon.

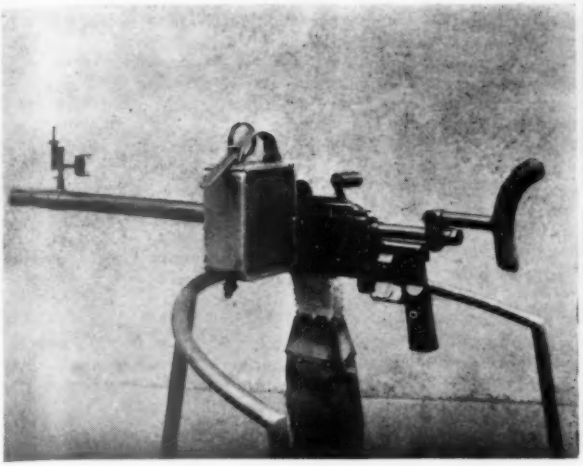
Since that time, I have received many interesting communications from readers asking for a more detailed account of the weapons concerned. There appears to be a group of aviation enthusiasts who were deeply interested in the interior ballistics of air weapons. Many of these readers are evidently above the average in intelligence for their inquiries and questions indicated that they have progressed much farther than the point where they can identify a Browning and know the difference between a gas-operated weapon and one utilizing a recoil spring.

The ballistics of air weapons is a very interesting subject, most comprehensive in its scope and one worthy of the attention of all interested in military aviation. Strangely enough, however, it is a chapter that has not as yet been written into textbooks for few have attempted to draw up a set standard of rules or tables.

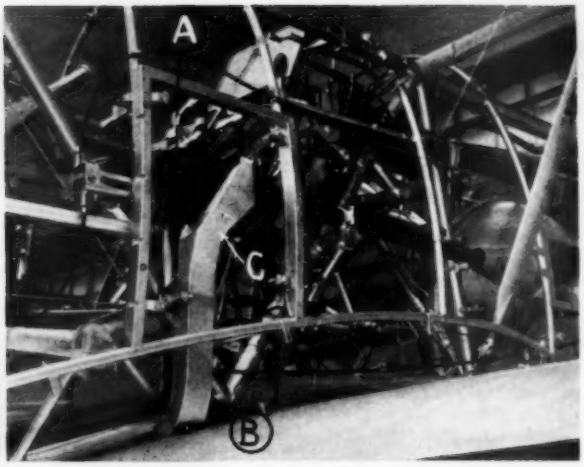
It has long been my contention that the gun mounted aboard a military plane is equally as important as the motor or propeller. I have long believed that, whatever progress is made in the design of military types, it will first have to move along the trend to more efficient and higher calibered weapons. In other words I am a sincere subscriber to what I like to call the "Cult of the Cannon".

In the previous article, I sketched a few details of most known air cannon in a somewhat primary manner because space allowances forbade extensive explanation. This month I am going to go into fuller detail on a weapon which has been generally accepted abroad and which may possibly be accepted for use on American military planes. Through the courtesy of Hanbrae A. Henckel of the Dansk Industri Syndicate, Copenhagen, manufacturers of the Madsen air

5 For the benefit of skeptics, this is what a 23 mm. explosive shell does to an all-metal wing. This is the point of entry and the shell already has started to rip the whole wing structure apart. Fig. 6 shows wing's rear.



3 This is the Madsen machine cannon arranged as a movable or observer's weapon. The cartridge container on the side holds 100 rounds of ammunition and can be changed quickly during action. This particular weapon is a 11.35 mm. gun that fires a bullet of 19.8 grains which uses a nitro-cellulose propellant. This gun is easily moved and aimed.



4 Above are further details of the fixed version of the air cannon mounted on a fighter. A shows the two finger triggers mounted inside the circular grip of the joy stick. B shows a portion of the synchronizing gear system. At C is the cartridge case and link ejection outlet.

cannon, I am able to present details of the Madsen 20 mm. and the 23 mm. weapons.

These guns are standard equipment on the Fokker G. 1 *Le Faucheur* or *Reaper*, which is a Dutch attack-bomber-reconnaissance machine, claimed by many experts to be the finest piece of aerial fighting equipment produced in the past three years. The Belgian Renard R-36, a new low-wing fighter designed along *Hurricane* lines, carries two of these guns.

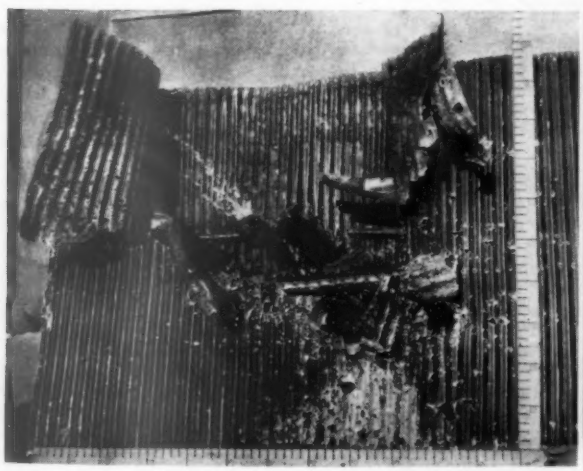
The Fokker D-21 fighter carries two of these guns, as does the Fokker C-11W a two-seater fighter-reconnaissance ship. The Koolhoven plant has adopted these weapons for the FK-52 fighter and the FK-55, the low-wing fighter which uses two propellers, turning in opposite directions. There are many other European models equipped with the Madsen weapon, and the general international situation over there during the past few months no doubt has caused many Air Service materiel officers to specify further adoption of these high caliber weapons.

The Madsen gun is produced in both the 20 mm. and the 23 mm. calibers. It is usually fed by a link belt when mounted in a fixed position. Illustrations accompanying this article offer very clear pictures of the weapon, the various types of mountings available and some detail of the general mechanism.

Both the 20 mm. gun and the 23 mm. gun are of the same weight and dimensions. The larger caliber gun is capable of firing a shell with terrific velocity and amazing explosive effect. It is believed by the manufacturers that duels in the air involving combat between high speed planes can only last at the best, a few seconds; and for that reason every available second should be used.

Madsen 23 mm. guns, firing from a flexible belt, will fire at the rate of twenty shells every three seconds as long as there is any ammunition in the cans. Cartridges for this weapon can be supplied with an explosive shell or with a shell that combines both explosive qualities and tracer effect.

An observer's or movable type of Madsen gun is also available, but not in the heavier calibers. Here the manu-



6 This is the rear of the all-metal wing shown on the opposite page, illustrating the bullet's point of exit. Here the shell has exploded, cutting a main spar, blasting out a section of dural tubing stiffener and tearing wide a great section of the corrugated sheeting. One shot like this could easily disable or wreck an entire airplane.

7 The same high explosive air cannon shells used against the all-metal wing at the left got the above results on a wood and fabric wing. The fabric has been ripped open but, owing to the fabric's lack of resistance, the shell has passed through before it could fully explode and shatter a spar.

facturers have decided that a mobile gun need not be quite so powerful. They make this model in 6.5, 8.0 and 11.35 mm. calibers. Normal feed is through a quickly-removable cartridge box which carries from 80 to 100 rounds. The gun itself is fitted with a padded shoulder rest, a business-like pistol grip and normal windvane sights which automatically make aim corrections during flight. Twin guns may be mounted on a special frame and there is also a convenient cartridge bag for catching the expended rounds.

The fixed weapon has a wide range of mountings and, as shown in Fig. 1, it is carried in the Fokker G-1 fighter-bomber accompanied by two 7.9 machine guns of Madsen manufacture. The tank (A) is part of the hydraulic-pneumatic system used in the automatic loading of the guns. The indicators (B) show the positions of the 7.9 mm. guns while (C) indicates how the 23 mm. cannon is set into the framework so that the breech mechanism is conveniently placed where the pilot can remedy any stoppages during air action.

This accessibility factor is a very important point in the mounting of guns, for once a gun suffers mechanical failure, due either to faulty ammunition or a minor breakage, it is hopelessly out of action *unless* the pilot can quickly and efficiently carry out what in armament parlance is known as "immediate action for the remedy of stoppages". For this reason then, guns mounted outboard in wings, in the fairing of undercarriage legs and such inaccessible places cannot be considered 100 percent efficient.

After all, the best guns do suffer mechanical failure, either because of faults in their own mechanism or because of faulty ammunition since the recoil is the basis of automatic action and continuous operation. For instance, a cartridge may burst and leave a portion of the casing in the barrel, preventing the next round from fully entering the breech. This would jam the locking mechanism. Again, a weakly loaded round cannot provide a sufficient recoil force to carry the mechanism far enough to complete the automatic cycle of firing.

In Fig. 2, the Madsen gun is shown with the synchronization system supplied by the manufacturer. In this view, (A) is the part connected with and timed to the propeller through which hydraulic impulses are imparted by a small pump. The pipe lines (B) and (C) carry the oil under pressure through the synchronizer system.

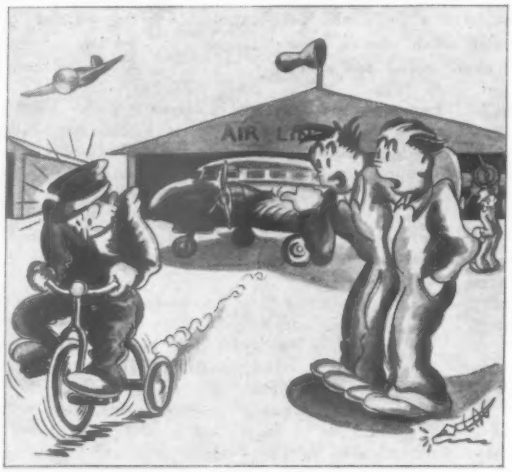
A pipe line (B) is the main pressure line to the trigger-tripping gear which controls the fire so that, when the blade of the propeller is in line with the gun muzzle, the trigger is drawn out of action and cannot discharge the gun. The pipe line (C) is the secondary oil line from the oil container to the impulse motor.

Fig. 2, also shows how the ammunition box is placed so that the shells are fed into an aperture or feeder house set on the left side of the gun. Ejected shells are dropped through an opening in the bottom of the gun, and carried away through a metal trough and usually dropped in the clear through an opening in the bottom of the cockpit.

The gun proper weighs 52 kg. or approximately 114½ pounds. The cartridge weigh about three-quarters pound so that one belt of 100 rounds weighs approximately 80 pounds including the flexible links.

The barrel is about four feet long and contains twelve rifling grooves inside. The force of recoil resulting from firing a single shot, is approximately 3,000 pounds, while during automatic firing the recoil reaches something like 3,630 pounds. This recoil is taken up through the mechanism which includes the muzzle buffer, a recoil arm and a recoil spring.

The 23 mm. fixed gun fires at an average of between 360 and 400 rounds per minute, depending on the type of ammunition used. The initial muzzle velocity is 730 meters per second (2,394 f.p.s.), according to the ballistics chart on the gun.



"He's gettin' in some ground work before taking her up . . ."

Madsen guns are air-cooled weapons, fully automatic and use practically the same system of movement as in most weapons of this type, resembling the Browning and Vickers guns in particular. The action comprises a backward and forward movement caused by the recoiling portions in the fixed portion of the gun, which, in turn, are actuated by the gases and a system of return springs. Most students of recoil action weapons will be familiar with this system.

Fixed portions of the gun include the barrel casing and frame, which are screwed together, the trigger-plate and the cartridge feeding mechanism. The moving portions, those which recoil with the explosion of the cartridge, are the barrel, the breech-block, and the breech-block bolt. The two groups are connected through the medium of the recoil arm which turns on a horizontal crank bolt.

All guns have a safety catch which consists of a transverse bolt and catch. On this bolt, opposite the end of the trigger rod, is a radial collar which, when the catch is set at the marking "S", engages under the end of the trigger rod and holds it from being depressed, thus preventing the gun from firing.

A feeding mechanism, much like that of the Vickers, incorporates a number of pawls or mechanical fingers which guide and direct the cartridges into the feeder house. At this point, a cartridge hook engages a flange of the cartridge and draws it back during the backward recoil movement. At the instant the cartridge hook strikes against a stop block, the round is released and a spring pawl on the stop block throws the cartridge forward into the cartridge seating in the breech block.

When the cartridge is home in the breech block, the moving parts have been carried forward, thus closing the breech. A firing-pin strikes the percussion cap and the round is fired, putting the recoil movement into action again. The gun can be set for single-shot firing as well as automatic firing.

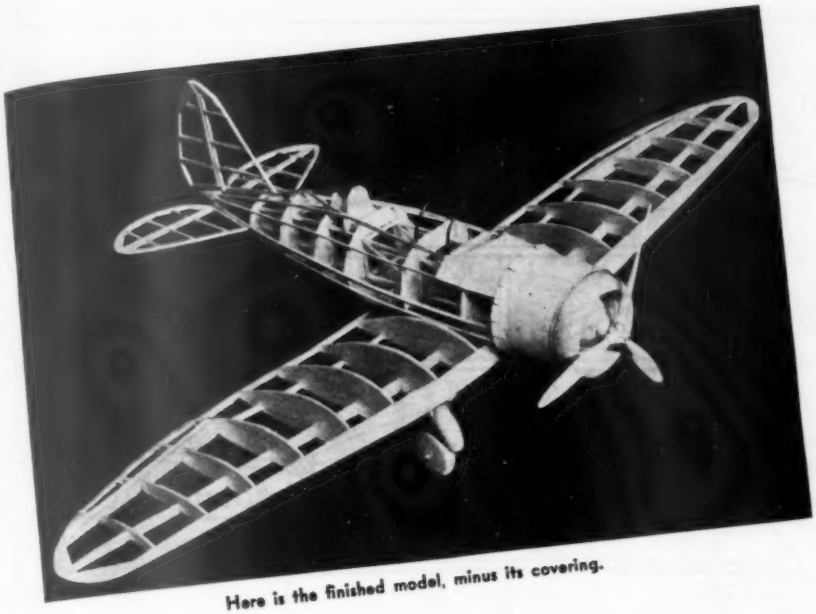
Figs. 5 and 6 disclose, with interesting detail, the effect of a single shot from a 23 mm. gun. In Fig. 5 we see the hole at the point of entry in an all-metal wing. Fitted with a light graze fuse, the shell has already started its explosion. In Fig. 6, showing the point of exit, we see what actually happens to the metal spars, ribs and corrugated skin.

A one-hundred round burst from a .30 caliber machine gun could do no such damage as this. In one test case, a single 23 mm. shell directed at a Hispano-Suiza, motor actually cut the engine in two, taking out two complete cylinders and a connecting rod. It also ripped most of the crankcase away from the main bearings.

This, then, is typical of modern armament as fitted to modern aircraft. How soon the United States will break away from its general belief in the .30 and .50 caliber gun remains to be seen. So far, the much vaunted Flying Fortresses do not carry anything more effective than .50 caliber guns whereas they were supposed to have been designed to carry some form of air cannon.

How a Boeing B-15 would fare against enemy aircraft equipped with such a weapon as the Madsen 23 mm. gun is not pleasant to contemplate. Most certainly, the effective range of the Madsen gun is far greater than that of the lighter Browning and explosive shells such as can be used in a 23 mm. weapon would play merry havoc amid the dural spars, ribs and panels of an all-metal target

(*Continued on page* 86)



Here is the finished model, minus its covering.

Here is a sleek, well-known ship famous as an Army fighter as well as a racer. It makes a trim, fine-performing model.

by PAUL W. LINDBERG
Model Editor and Designer

A SEVERSKY RUBBER-POWERED MODEL

MOST model builders are familiar with the name of Seversky and we know that you will be proud to own an exact scale model of the ship that won the 1938 Bendix Trophy Race. (Also see page 10.) There is plenty of pep in this model and plans are drawn full size but if you so desire, they may be enlarged two times in order to give a better flying model. All details have been carefully worked out on the plan and if strictly adhered to, you will find very little difficulty in building this excellent model.

Construction of Fuselage

Constructing the fuselage is simple if the following steps are taken. First, place a sheet of waxed paper over the plan so that none of the parts will stick to same. In building the rectangular fuselage, build the two sides and cement these together with cross members of $\frac{1}{16}$" square hard balsa.

All formers are cut from $\frac{1}{32}$" balsa wood. Cut these to the various shapes as shown in template on the plan. In cementing these in their respective positions to the fuselage, make sure all projecting edges are sanded down smooth so that the stringers will be in a more streamlined form on the body. The stringers are made from $\frac{1}{32}$" by $\frac{1}{16}$" hard balsa and are cemented to the formers as clearly shown on plan.

The front part of cowl is turned from a piece of solid balsa. Remaining part is of one piece of stiff paper cemented together at bottom. Motor construction is shown in detail. Give these parts a great deal of time as you will be well rewarded in the finished effects of your model.

Construction of Wings

Construct these upon a flat surface after first placing a sheet of wax paper upon the plan. All ribs are cut to form with templates shown on plan. After the two halves are completed, they are cemented together at their centers. No additional bracing is required other than shown on plan due to the great number of ribs which give it ample strength. Movable ailerons may, or may not be built into the panel but we highly recommend these to take care of the propeller torque when model is flown. Aluminum inserts are used for hinges.

Building the Elevator and Rudder

These two are of movable type but may be built otherwise if desired. one-sixteenth-inch square is used in the construction throughout, with the exception of the trailing edges for both elevator and rudder which are of $\frac{1}{16}$" sheet balsa. We might add here that rudder and elevator are to be covered with tissue before cementing them to the fuselage. In cementing these to the fuselage, brace thoroughly so that no flabby motion is had while model is in flight.

Construction of Landing Gear and Other Details

The landing gear is of the fixed type and cannot be retracted. Solid soft balsa fairings are used throughout. If no streamlined wheels are available, a pair of balsa wheels turned up on any ordinary lathe will serve the purpose.

Two types of propellers are shown. One scale prop which is to be used only for exhibitional purposes. The flying propeller has, as you will note, much more blade area which is sufficient to fly the model. We recommend six strands of ⅛" flat rubber in flying this model.

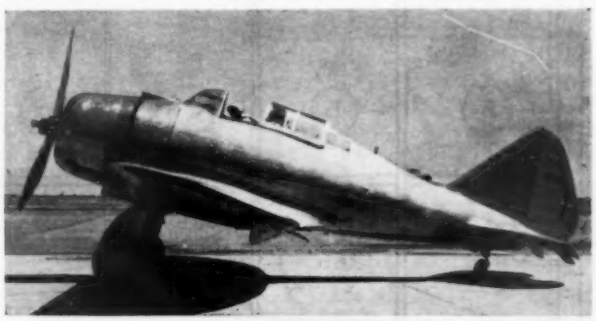
Ordinary Japanese tissue is used in covering. Do not attempt to cover the body in too wide pieces. We suggest one stringer space at a time. After all parts are covered, apply a light coat of water. This will shrink the tissue up lightly so that the coats of clear dope may be added.

Color scheme for this model is all silver with black details.

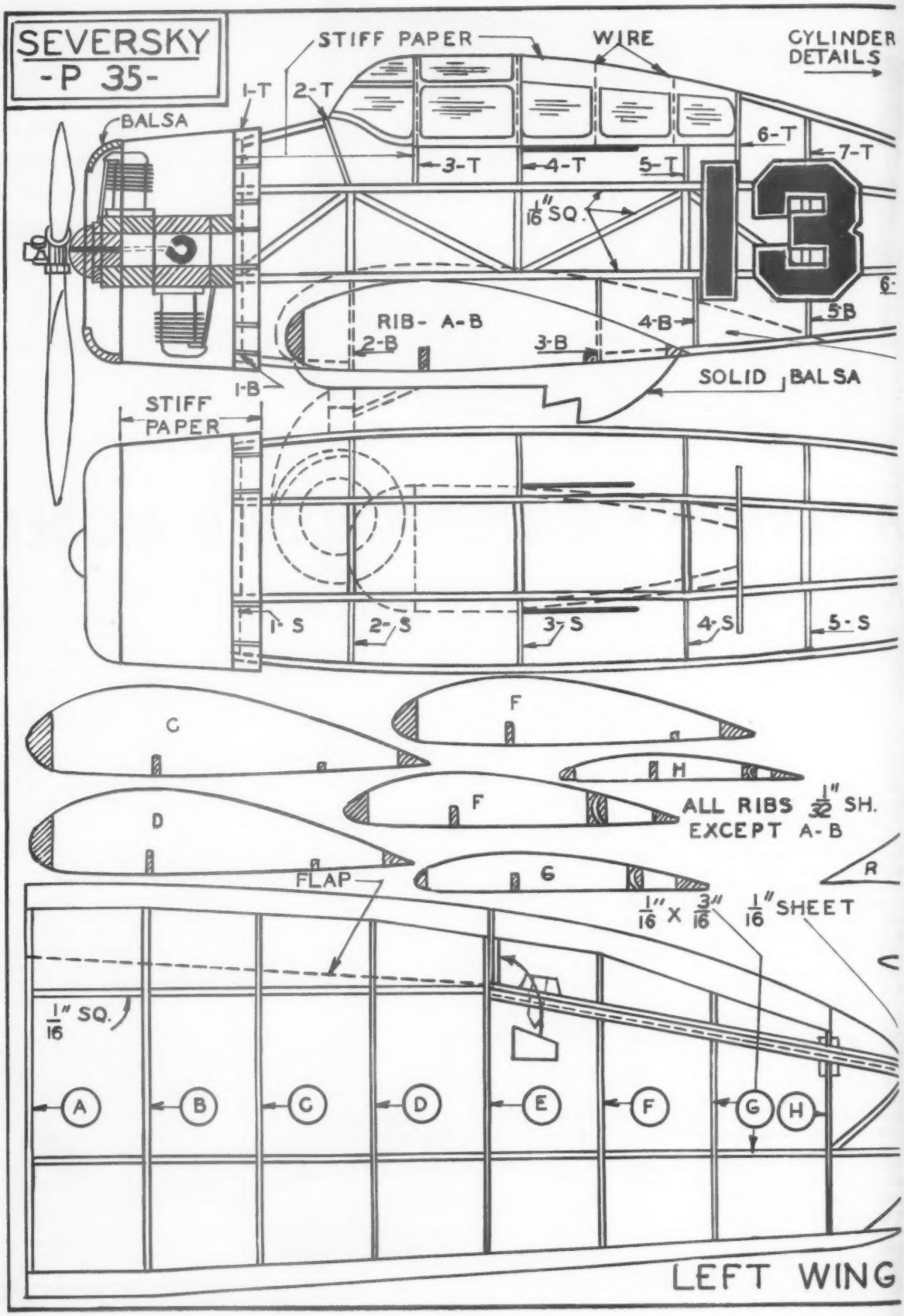
Testing and Flying the Model

Launch the model gently from your hand in a slight downward angle. If model should rise abruptly with nose up, weight should be added to the bottom part of front of cowl. If the reverse happens, add weight to the tail.

END



This is the real-life ship after which our model is patterned.


SEVERSKY
-P 35-
STIFF PAPER
WIRE
CYLINDER DETAILS
BALSA
1-T
2-T
3-T
4-T
5-T
6-T
7-T
1/16" SQ.
13
6
5B
4-B
RIB- A-B
2-B
3-B
1-B
SOLID BALSA
STIFF PAPER
1-S
2-S
3-S
4-S
5-S
C
F
H
F
D
ALL RIBS 1/32" SH. EXCEPT A-B
FLAP
G
R
1/16" X 3/16"
1/16" SHEET
1/16" SQ.
A
B
C
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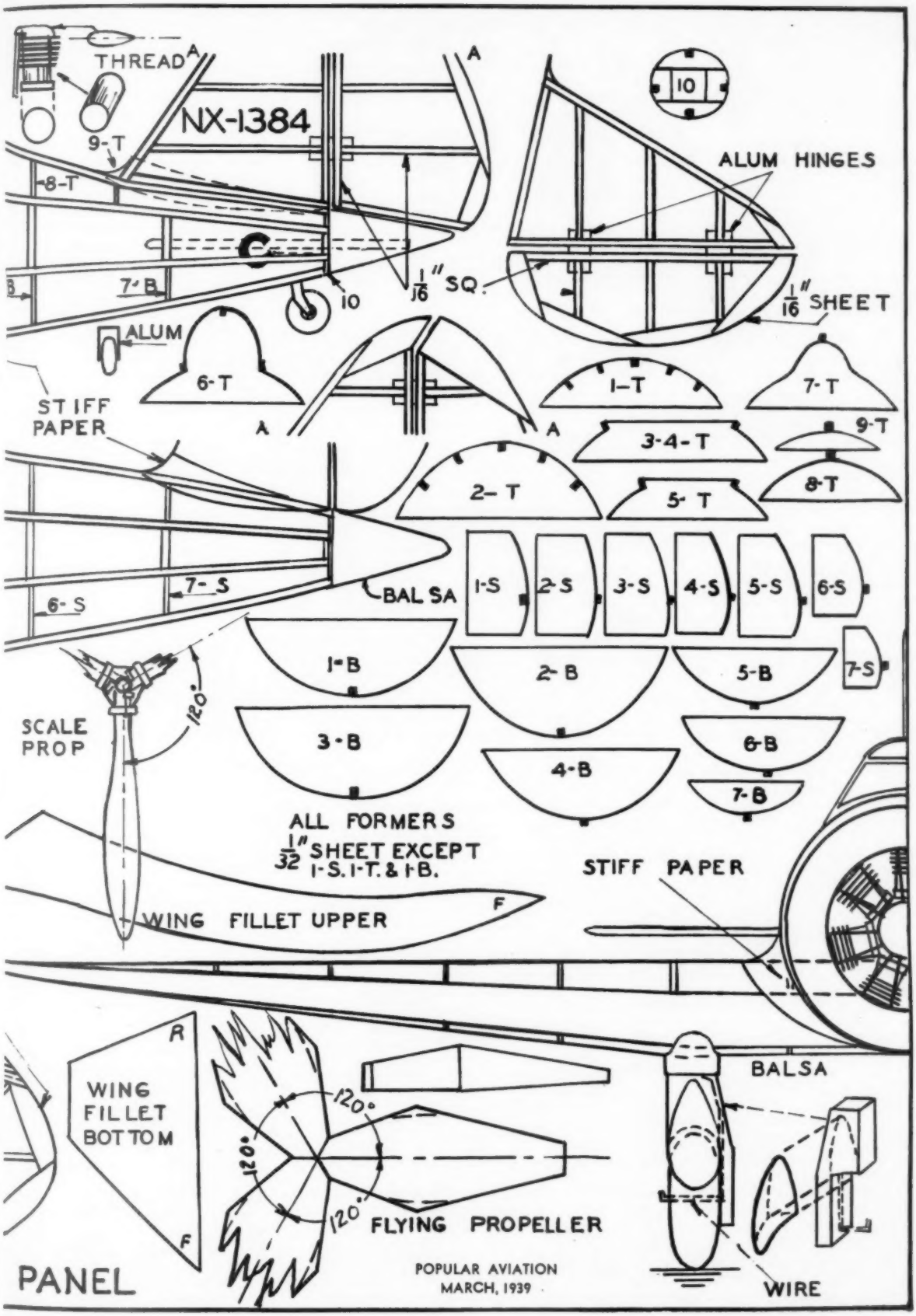
E
F
G
H
LEFT WING


NX-1384
THREAD
9-T
8-T
7-B
10
A
ALUM
6-T
STIFF PAPER
6-S
7-S
BALSA
1/16" SQ.
ALUM HINGES
1/16" SHEET
10
1-T
7-T
3-4-T
9-T
2-T
5-T
8-T
1-S
2-S
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4-S
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6-S
7-S
1-B
2-B
3-B
4-B
5-B
6-B
7-B
SCALE PROP
120°
ALL FORMERS 1/32" SHEET EXCEPT 1-S. 1-T. & 1-B.
STIFF PAPER
WING FILLET UPPER
F
R
WING FILLET BOTTOM
F
120°
120°
120°
FLYING PROPELLER
BALSA
WIRE
PANEL
POPULAR AVIATION
MARCH, 1939

The Ballyhoo Boys

(*Continued from page 27*)

then, though, Baldwin has been sold on air transportation and uses it quite frequently.

There are a few others in airline publicity—such as Carl Anderson at Los Angeles, Leo Boyle at Boston (both of American), TWA's Ruth McQueen at San Francisco, Pan American's Art Curtis at Miami, George Gardner at New York and Francis Walton at San Francisco, TWA's Jack Law at New York and United's Harvey Hancock at Salt Lake City. There you just about have the airline publicity picture for the United States. All well-paid men and women—all basically smart. Many are handicapped by front office views and politics, some are independent and fearless.

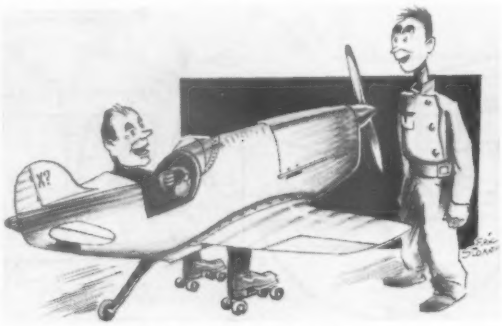
There are a wealth of publicity outlets employed by the Ballyhoo Boys to put across their particular story. Of course, the newspapers are first. Then come the general magazines, network radio and local radio stations, advertising tie-ups, trade journals, then smaller magazines such as Chamber of Commerce publications.

There seems to be a definite trend toward realism in airline publicity—some of the brainier of the Ballyhoo Boys are trying to get away from the P. T. Barnum methods of dramatization. In the past—and currently, too—a number of the airlines' best publicists resort to "gags" and "stunts" for their free newspaper space. Steve Hannigan very successfully employs this type of publicity in Miami Beach. His genius in presenting the Florida resort attracts thousands there annually. It is questionable, however, if "gag" publicity sells many airline tickets.

Stewardesses and hostesses bear the brunt of much publicity. If the gals who fly on the airlines could do all the things that press agents say they can well, they'd be the most versatile bunch of humans in the world. They drive spikes, collect rabbits, go mountain climbing, model at fashion shows and do almost anything for the sake of dear publicity. On the serious side, the Ballyhoo Boys push out traffic and express and mail volume figures. If the month has been a lean one, then the Ballyhoo Boys compare it with an even lower month or work out some sort of a wrinkle that definitely proves that air transportation is still going ahead on its forward surge.

There is a very fine line between "gag" publicity and hoaxes. Perhaps the all-time high was reached by one of the Ballyhoo Boys when he thought that a noted criminal was aboard one of his planes—being transferred from one state to another. At a large airport the newshawks gathered, cameras in hand, to record the arrival. The ship arrived, but the press agent learned there was no shackled criminal aboard. So the publicist had himself shackled, hired two strong-arm boys and then directed his own exit from the plane. Cameras clicked and the press agent snarled and avoided the cameras with the anger of a bona fide public enemy. The ruse was a corker, except that the criminal—at the same moment—was landing in a city 500 miles distant on board a plane of a rival line.

One airline attracted a lot of attention a few years ago when a comely blonde—a nudist at heart—stepped aboard a ship in Los Angeles and announced she would be in the nude when she deplaned in New York. Police were called out at Newark to avoid such an undignified happening. She did show a great expanse of leg on arrival, but the birthday suit was missing.



"It'll be the first retractable landing gear ship to sell for less than $1,000 . . ."

Here are a few more little notes that we've picked up from ex-press agents: the airlines have been celebrating the first decade of air transportation for the past three years . . . every winter a special "snow plane" has flown from some point to a famed winter resort—but that "snow plane" has yet to leave Los Angeles for its first trip.

The Ballyhoo Boys are great for covering up the news, too. A great trick of the movie colony in Los Angeles is to leave a big party and decide to fly east—sort of A.W.O.L. When a cinema biggie (just off from a party) arrives at intermediate points he is not greeted by the fan-fare equal to his high position. Why? Because the Ballyhoo Boys are good at keeping secrets . . . A notorious San Francisco woman, allegedly a white slave procurer, bought an airline ticket not so long ago—the police were on her trail. That airline's press agents darned near broke their backs to keep the fact out of the papers that the woman was aboard their plane. They succeeded, incidentally. You've heard, too, that animals are not allowed on airline planes, but some of the outstanding airline stories of 1938 involved air travel by pandas, dogs, cats, trained fleas, mice and even turtles.

In making this study for POPULAR AVIATION about the Ballyhoo Boys the chief fallacy seems to be that the publicity boys don't know as much as they might about the things they write on. So pressed are they for time that they rarely find a chance to get out and fly around their own lines or to study what other lines are doing to get their service across to the public. Though the average press agent won't make this complaint to his immediate superior, it is much in evidence by the duplication of material appearing in public print. The complaint of some city desks POPULAR AVIATION has queried is that too often the airlines ignorantly try to get advertising material into their stories. "We can't use telephone numbers of district offices," one press agent was told sharply by a city editor a few weeks ago.

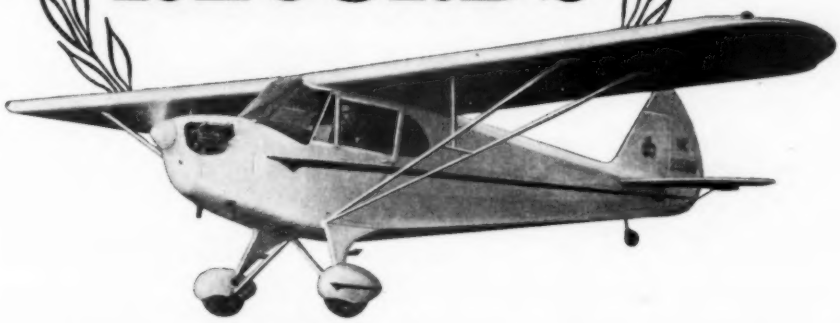
The day of the good, spanking airline scoop is about over. No longer do aviation editors lurk behind hangar doors to learn what happened when five inches of propeller shook lose from a transport. No longer are the mechanics and their helpers the close, drinking companions of the newspapermen. Instead, the newspaperman has been told by his city editor that there are no longer funds to make a "beat" out of the airport. And because lips of mechanics, etc., have been sealed by the rigid censorship of publicity departments, that rare story of yesteryear is even rarer today.

Many of our domestic airlines harbor a wealth of material that has never been published. Perhaps it's because the Ballyhoo Boys are prone to regard the public as a collective group of ignorant babies whose fear or apprehension must not be aroused by the mention of such things as "oxygen" and "mountains." For more than a year at least two of our domestic lines have had their Douglases fully equipped with oxygen for high altitude flying. When airlines fly above 10,000 feet or so, the crew members take an occasional sip of oxygen. It's available for passengers, too. How many prospective passengers read about the airlines clearing 10,000 foot terrain and decide not to fly because they fear there is no oxygen aboard the plane?

In the same school of thought, it is interesting to note that hundreds of thousands of travelers who could use air travel to advantage are afraid to do so because they have a heart condition of one sort or other. For at least a year, the airlines have known that it is just as safe for a person with a heart

(*Continued on page 77*)

CUB
makes and breaks
RECORDS



THE MAKING and breaking of records—production, sales, endurance flights, performance feats, mass air tours, etc.—seems to be a Cub habit. Scarcely a day passes without Cub scoring some new achievement. And this means much—not because Cub cherishes records for their glory but because the birth of each new star throws more light on the path of private flying:

★ Biggest mass flight (185 Cubs) ever held of a single type of commercial plane, to Miami, Florida in January, 1939. Over 350,000 aggregate miles.

★ Lightplane world endurance record: 218 hours, 23 minutes. Held by Tom Smith, Harley Long, and Clyde Schlieper flying "The Little Bear" over Lancaster, California. November, 1938.

★ Production and sales record: 111 during August, 1938. More than any company has produced and sold in any one month since the invention of the airplane in 1903.

★ Long distance non-stop lightplane refueling record: 2390 miles. Held by Kenneth Kress and Glenn Englert flying a Lenape Papoose Cub New York-Miami-New York. May 19, 1938.

★ First airplane to be used in a civilian training program by a state. Five bought by the Bureau of Aeronautics, Nashville, Tennessee, through its director, Major Walter M. Williams, for training fifteen selected civilians per year in each of five major cities.

★ For the past three years one-third of all aircraft sold commercially in the United States has been Cubs. Last year this proportion held, with the further distinction that of *lightplane* sales Cub accounted for one-half.

Free Flying Course

Cub dealers throughout the country are prepared to give every purchaser of a new Cub airplane a course of dual flying instruction in the purchaser's own plane, without charge. This free course is given by Government licensed instructors. Your Cub dealer will be glad to give you a free flight demonstration.

Free Catalog!

Send today for colorful, illustrated new 1939 Cub catalog, full details of the free flying course and name of your Cub dealer. Piper Aircraft Corporation, 39 Aviation St., Lock Haven, Pa., U.S.A. . . . Cub Aircraft Co., Ltd., Copenhagen, Denmark and Cub Aircraft Ltd., Hamilton, Canada.

★ Largest civilian mass flight ever held in Canada of one type of plane: First Annual Canadian Cub Tour. 51 Cubs to Hamilton and Toronto Sept., 1938.

★ First airplane to feature free flying course with each plane sold. 5,872 hours (worth $38,168 at the average rate of $6.50 per hour for dual instruction) since this offer was announced eleven months ago.

★ Cub factory is located in the "flyingest city in the world" where one out of every 90 inhabitants is a pilot in distinction to the national average of 1 out of every 3000.

★ Most active flying club in the world uses Cub. Factory employees' club, averaging 80 members from month to month, has logged over 7000 hours in three years. "Cub Fliers of Lock Haven."

★ More than 20,000 student pilots are taking their training in Cubs—and this number is increasing daily.

★ Cub manufactures the most complete line of light airplanes on the market . . . Cub Trainer $1249; Cub Sport (Continental 40 H.P. engine) $1395; Cub Sport (choice of 50 H.P. engines) from $1499; Cub Coupe (Continental 50 H.P. engine) $1995; Cub Seaplane from $1944; Cub Skiplane from $1299. All prices F.A.F. Lock Haven, Pa.

There's a Cub for Every Purse and Purpose - - - from $419 Down

COUNT THE CUBS THE WORLD'S FASTEST SELLING AIRPLANE

A Radio-Controlled Gas Model

(*Continued from page 46*)

in local and national model competition. The plane has a 12-foot wing spread and a seven-foot fuselage. It is powered by a 1/3 h.p. Forester gas engine, and it weighs about 12 pounds complete with all radio equipment, batteries and fuel. It has sufficient power to take off and climb steadily, provided there is not a strong wind.

Our control has been used for direction only because we wanted to thoroughly master turning the ship before we tried diving or zooming it. It is easy enough to wash out the experiment if there is only one control to manipulate; particularly if the ship turns across a gusty wind when it is only a few feet off the ground. Control of direction is more valuable and necessary than control of elevation. It is amazing how accurately an undirected plane will head for the only power line or tree in the vicinity or make a bee line for a lake and land in the middle of it. It is most important to keep the plane within vision and to make it land on the field from which it took off, not to mention the fun you can have turning it to the right or left and describing figure eights in the sky.

Four receivers have been used in our plane. The first was patterned after the receiver Ross Hull described for use in sailplanes. It was found to be impractical for powered ships because its output was too low to operate the relay satisfactorily when the contacts and tension spring were adjusted for minimum effect of motor vibration. The receiver operated on pulses of carrier which would stop the super-regenerative hiss of the detector which in turn caused the bias on the grid of the second audio tube to be substantially reduced, causing a change from .6 to 2 ma. in plate current. The idling .6 ma. of plate current magnetized the core of the Eby relay enough to make tension adjustments difficult and the additional 1.4 ma. plate current (when a pulse of carrier was transmitted) was not quite enough to close the contacts when they were adjusted for minimum effect of motor vibration.

After taking stock of the situation we decided there must be some other way which would eliminate the relay and its troubles and at the same time reduce the weight of the receiver. A tuned reed system was decided upon because it would permit selective right or left direction and would not be influenced by a frequency other than the resonant frequency of the reed. After considerable effort a reed system which would operate on one milliwatt was built. It worked very well as long as it was fed a pure tone from a good audio oscillator, but distortion of the transmitted wave form on the low frequencies (30-70 cycles which were found optimum for transmitting power to the motor) caused us to abandon the reed experiment.

Those of you who have worked with audio amplifiers on low frequencies will appreciate that distortion of wave form is more apparent and amplifier efficiency falls off rapidly below 100 cycles unless special design features and components are used. The added complications and increased weight of the receiver, let alone the construction of a high quality modulator and accurate tone generators made it impractical. However, we learned that reeds can be operated on low power, and we know that fundamentally a reed system can be made to work.

Our next receiver—and the first successful one—was an improvement on the Hull receiver. It used a 1H4G detector, 1E5G second audio, and a 49 in the last audio stage with a 5000 ohm Eby relay in the plate circuit. The 1H4G was found to be better than a 30 as a super-regenerative detector and also less microphonic. It was coupled to the 1E5G through a coreless 5 to 1 audio transformer. A transformer is best in this circuit because voltage drop in a plate resistor would be very wasteful with only 45 volts of "B" battery available. The core was removed in order to reduce weight and also because it is unnecessary for amplification of rush frequencies which operate the relay.

Several successful flights were made until a major crackup resulted from a small whirlwind taking charge of things just after the ship had taken off. By the time the plane had been restored to normal, Raytheon Production Corp. had announced a new type gas filled triode (RK62) designed to operate on 45 volts of battery with a large enough carrier on and off plate current change to operate a sensitive relay. The filament current and voltage is also lower (rated at 1.4 at 50 ma.) permitting the receiver to operate on a single flashlight battery of the fountain pen type, though it may be necessary to use two cells and a series resistance to limit the filament voltage to about two volts if the set will not work satisfactorily any other way. A sensitive relay built like a meter movement and capable of operating on only four milliwatts d.c., available in field resistances of 50 to 8000 ohms, is an ideal partner for the one tube receiver. The relay is manufactured by the Sigma Instruments Co., Belmont, Mass., and is available only through them. It is furnished to modelers stripped of mounting base and dust cover and weighs only three ounces.

For those who wish to control both elevators and rudder and possibly ailerons and throttle, the new tube and the lightweight relay have opened the way. Such a plane could be built so that it would not be much larger than our ship, but of course such a job shouldn't be tackled by a novice.

Probably the best plan for the newcomer to the directed model field would be to build a ship capable of carrying about one and one-half pounds of equipment. Such a plane would be less apt to be buffeted by playful winds and its lower cost makes it more desirable.

Control tabs should be rather small. On our ship a tab nine inches long and two inches wide at the bottom and tapered to a point at the top was plenty when turned ten to fifteen degrees. The stabilizer has an area of 116 square inches. A large rudder tab would lead to overcontrolling and probably a crackup. Unless an obstruction is in the path, it is best not to try to turn the plane until it has sufficient altitude so that it can regain its stability if flying speed is lost. Probably this altitude should be set at a hundred feet or more for initial flights. Low altitude turns are more safely made against the torque of the motor and propeller because the plane will be less likely to spin. It is even recommended that the neutral position of the rudder tab be set so as to counteract the torque even to the extent that the plane will execute counter torque turns of large radius.

A radio control transmitter does not differ from conventional amateur radio rigs except that operation may be necessary on several frequencies if two or more receivers are installed in the model. Electron coupled oscillators, or crystal oscillators on 14 mc. with outputs doubling to 28 mc. and driving a doubler on 56 mc. will be very satisfactory for a radio control transmitter. The power output need not be very great, but depends upon how far away positive control of the model will be necessary. Two to five watts is enough for most work, but this depends upon how sensitive the receiver is.

Distribution of weight is important when installing the radio apparatus in the plane. Try to mount everything that is heavy as near the center of gravity as possible, then shift the batteries around until the plane is properly balanced. Glide tests on the ground will tell an experienced model builder whether or not the balance is right and observation of the ship in flight is, of course, the final test.

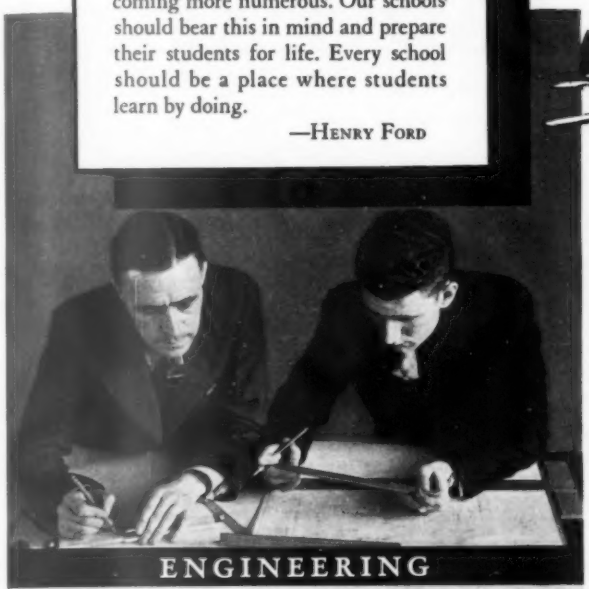
This has been a model builder's vision for many years, dating 'way back from the earliest model building days when attempts were made at model control by means of the Branley-coherer that made radio history when radio was known as "wireless". And there is still an opportunity for the old coherer at that.

If you do try this exciting hobby, I hope that you have as much fun as I have had. It's really worth losing several nights' sleep to watch a radio controlled ship do its stuff; and if you don't learn a lot about flying an airplane and making a one-lung gas engine tick, I'll miss my guess. Above all, don't be discouraged if it cracks up on its first flight. Even the big ones do that once in a while.

END

AMERICA knows but one direction and that is onward. Time will bring changes but not in the main course. The openings and opportunities for men and women who can do things, who know their jobs are becoming more numerous. Our schools should bear this in mind and prepare their students for life. Every school should be a place where students learn by doing.

—HENRY FORD



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Here Comes a Whirligig!

(*Continued from page 14*)

of 45 degrees in what he called "towering," as contrasted to the "jump" take-off of the American autogiro.

And, finally, he discovered, quite by accident, that torque—the revolving effect which a rotor transmits to an entire plane when power is applied to the blades—can be reduced to the point where it is practically negligible even at high rotor speeds.

"My gyroplane was only an intermediate step between a fixed-wing plane and a helicopter," said Hafner. "The gyroplane is only a hybrid. My next helicopter will be tested in 1939."

Acrimonious differences of opinion prevail among the rotating-wing enthusiasts. The chief division is between the gyroplane and the helicopter people. The next is between the co-axial rotor, the single rotor and the balanced rotor inventors.

Co-axial is just what it sounds like—two rotors, mounted one above the other, to overcome torque effect. The de Bothezat machine, now in construction, employs the co-axial principle, with his engine mounted between the rotors. The Focke machine, with outriggers supporting rotors which turn in opposite directions, effectively damps out torque.

Those opposed to co-axial construction point out that a rotor superimposed on another robs the lower blades of virtually all their lifting power. The down-sweep of air from the top rotor is burbly, with no lifting power, just like the air at the aft portion of the boundary layer on the top of a conventional airplane wing.

The objection to the Focke machine is that it presents too much mechanical mass. There is just too much flying machine for the amount of work it will do. It is clumsy in appearance.

Hafner's answer to the helicopter problem is a one-rotor machine in which a very low torque effect will be mechanically compensated for.

Readers of POPULAR AVIATION know, of course, that the gyroplane or autogyro obtains propulsion for horizontal flight with a conventional airplane propeller on the nose of the ship. The windmill is auto-rotative, or "free-wheeling," spun by the slip stream from the prop and the flow of air incident to forward movement —or, in vertical descent, by the upward rush of air against the rotor.

The helicopter obtains forward movement, not with a propeller, but by tilting the rotor at an angle of from two to six degrees from the vertical. The blades are nothing more than elongated air foils, or wings.

Rotating-wing machines generally are considered incapable of the speed of fixed-wing planes because the blade tips at around 225 miles an hour line-of-flight speed begin approaching the speed of sound and encounter what engineers know as "compressibility burble."

Among the interesting helicopter experiments is that of Prof. Montgomery Knight, of the Georgia School of Technology, who hopes to damp out torque effect by jet propulsion of his rotor—shooting compressed air through the blade tips at right angles to their longitudinal axis.

But how was Hafner going to build his helicopter?

"You see," he explained, "the torque effect of my rotor will be extremely low. My rotor speed, and its lifting capacity, will be very high. The blades will be strong, but long, slim and rather thin.

"Now." He paused. This was his main point. "The downwash of air from a rotor is practically equal forward and aft, isn't it? Very well. Why don't we let the fuselage itself damp out the rest of the torque?

"The fuselage will be long and slim. It will have pronounced vertical surfaces. The downwash at the forward end of the fuselage will beat against the right side of the fuselage, that at the back end against the left side of the fuselage. By proper design, to compensate for forward speed, we can make those forces balance each other."

So the problem of vertical and hovering flight was virtually solved!

Hafner smiled broadly. "Helicopters will be just like automobiles," he said. Now we were getting into prophecy, and that was the very thing I wanted to avoid.

Hafner shook his head. "It isn't prophecy. It's just plain common sense. My helicopter, the performance curves show, will climb at the rate of more than 3,000 feet a minute. It will hover. It will be capable of speeds up to 230 m.p.h., with proper powering.

"The fixed wing plane, I want to emphasize, will always have its place. It is a splendid piece of mechanism. But let no one be so foolish as to say that a helicopter will not equal a fixed-wing plane in efficiency. It will."

There is no doubt but what the Haffner principle is miles ahead of any of the revolving screw family, even superior to the autogiro, but there are still long miles to go.

Looking ahead to 1945: Heads up! One of those windmill contraptions is about to land on the roof.

END

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1938			
January	7	14	6
February	1	9	7
March	40	16	6
April	6	13	3
May	6	12	6
June	30	5	4
July	4	8	4
August	2	3	3
September	29	12	10
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November	3	6	4
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Aerobatics

(*Continued from page* 16)

a collosal national shudder at the mere mention of aerobatics.

Remember first of all that safe aerobatics have a series of dont's which no one can ignore. The first one, the most important one, is that you must not stunt too close to the ground. The Civil Aeronautics Authority sets the minimum at 1,500 feet. Follow this rule and half the headlines now being marked up will be eliminated. This should be the lowest altitude for all "out of control" maneuvers, such as spins, snap rolls and the falling leaf, even for professional exhibition flyers. The slow roll at low altitude is another extremely hazardous maneuver and it has claimed many lives.

You may have seen me skimming an airport during an exhibition, but remember this:

First of all, I have excess speed and control on all maneuvers I execute below 1,500 feet and they are all maneuvers in which the ship *never* approaches the stalling point. Moreover, even today, with 22 years of flying behind me, I experiment thoroughly at high altitudes whenever I am stunting a ship new to me. My maneuvers may require a week or more of high altitude practice. Before I am satisfied with the ship it has been in every position an airplane can get into.

Next, the airplane must be structurally sound because aerobatics impose high stresses. I am sure that no airplane manufacturer will take issue with me when I say that the modern commercial airplane is not intended for aerobatic use. While most are perfectly safe for the execution of stalls, wingovers, spins, Immelmanns, loops and even single snap rolls—they are not designed to stand these stresses any more than the modern passenger automobile is designed to compete in professional automobile races. It is true that an expert aerobatic pilot may put a standard stock model commercial airplane through intricate maneuvers without throwing any severe stresses on it. However, the average inexperienced pilot can literally tear it to pieces because he has not trained himself to "go gently" and fly the ship through the maneuvers properly and with the correct air speed.

This generally limits the field of ships available for constant stunt work. I had found during recent years satisfactory performance in both monoplanes and biplanes. So far as I am personally concerned, I prefer open cockpit jobs. But the finding of a safe ship is just the beginning. You may be sure that before I do any extensive stunting the ship is completely checked over by yours truly and is braced where experience has taught me that special bracing is necessary.

When the ship is ready for me, you can depend upon it that the propeller will be perfectly balanced to prevent excessive vibration at high speeds. The motor will be of a type capable of standing continuous high r.p.m.'s in dives. It will be equipped to run perfectly upside down as well as right side up. The airplane must have an almost perfect dynamic balance in any conceivable position and at any speed. It must be free of any bad spinning characteristics either right side up or upside down. The controls must respond easily and quickly at any speed. Lap belts and shoulder belts of sufficient strength must be provided with safety releases to enable me to escape from the airplane quickly in case of structural failure. A good 'chute must be packed frequently to provide a fast opening in case of serious trouble close to the ground. After all this, there will be many, many hours of practice at very high altitude.

This gives you a general idea why aerobatics have proved safe for me and how you can make them safe for yourself. Frankly, I have been stunting for so many years that I have developed at least two "outs" for any possible trouble in which I might find myself. I've provided double-barreled protection. If you will glance back over the last few paragraphs, moreover, you will find that I've eliminated the three greatest causes of trouble in aerobatics—lack of altitude, engine failure and structural failure. Only under these conditions are aerobatics safe.

Recently we have had an epidemic of accidents due to stunting. Not long ago

(*Concluded on page* 76)

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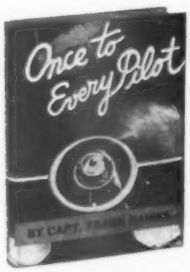

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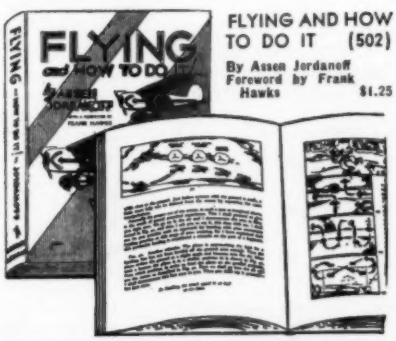

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Aerobatics Are Insurance

(*Continued from page 74*)

a pilot with but little aerobatic practice in recent years stunted a commercial plane—a cabin job—at low altitude. He stacked it. He violated the rule against using a standard commercial ship for advanced aerobatics. He also flew too low. He tried his stunt without adequate visibility, for stunting close to the ground demands unobstructed view of the ground and the horizon at all times.

In another recent case student and instructor stunted a small cabin plane at less than one thousand feet—put it through violent maneuvers. A wing came off. The ship crashed. One occupant was still in the cockpit. The other had tried to leave. His body was half inside and half out of the cockpit. He had pulled his parachute rip-cord and the parachute had spilled inside the cabin. Obviously here are two violations, both stunting too low and using the wrong type of ship.

One of the greatest menaces to the reputation of aerobatics is the know-it-all type of young pilot. I think you must know the guy. He is always saying:

"I'll fly that crate. Sure. I'll fly anything, any time."

He's making a date with the undertaker when he says that.

I remember watching a pilot pretty well known up and down the Pacific Coast one day as he gave an old Standard J-1 Hisso the works. He didn't even bother to wear a parachute. The Standard was a sturdy old crate—and took it. When the pilot landed he swaggered up to a small band of admirers.

"Just show me the ship," he said, "and I'll really wring it out."

I knew then that the flag was up against him. A few weeks later I drifted into the airport at Pasco, Washington, and there he was in all his glory. He was studying a new light monoplane which had just arrived from its mid-western factory. Nobody had had a chance to give it a workout.

"What'll it do?" the pilot asked the distributor.

"The factory says, 'anything'," the distributor replied.

Either the factory was wrong or the distributor was exaggerating. My daring young aerobat shed a wing. Aerobatics and aviation got a double dose of unfavorable publicity because the accident was labelled "unexplainable."

Again at Corvallis, Oregon, a distributor claimed that a high-wing monoplane he was selling was easy to spin and that it would recover from the spin instantly. Somebody questioned this. He went up, started his spin at a thousand feet, pulled out under 300 feet and mushed right on into the ground. Another black eye for aerobatics.

That such accidents should happen is a sad testimonial not to aerobatics but to pilots who are foolhardy. Carelessness, showoffishness, thoughtlessness and mental lapses which approximate idiocy are responsible for needless slaughter.

It was absolutely inexcusable that in Seattle two youths went aloft to stunt without wearing parachutes and without even taking the precaution to fasten their safety belts. They stalled at the top of a loop. Both fell out of the ship and were killed.

I cite these accidents to impress upon your mind the need for precaution. I have said that I do not fear aerobatics because I have learned to understand them. At the same time I also understand their stresses together with other aerodynamic characteristics and I take due precautions against all these elements. Don't think for a moment that when I lost my fear of aerobatics I also lost respect for their possible hazards.

I have stated that I recommend aerobatics as safety insurance in flying. But, at the same time, I wish to point out emphatically that aerobatics must be approached with sanity. If students are taught aerobatics in good airplanes equipped for aerobatic flying and such instruction is given at high altitudes we are going to have better and safer pilots. They are going to know what to do in an emergency. They will react coolly and precisely in an emergency. The unpracticed will become frightened, fall victims to panic and function fatally in that split second when life and death are in the balance.

END

Mr. Wiggins Sells 'Em

(*Continued from page 54*)

few pilots in the country who had passed the half-century mark. His daily flying activities inspired widespread mention in the public press and five years later more than 300 men, all over 50 years of age, held pilots' licenses. This prompted Gar Wood, Detroit sportsman and speedboat expert, to organize an informal organization which was called the Over-Fifty Birds. The Over-Fifty insignia can be found on Wiggins' personal plane. A few years ago he gave up solo flying and is now accompanied by one of his senior pilots on aerial gallops around various parts of the country.

Wiggins is a firm believer in the club-flying movement and has done much to organize flying clubs in New England. "It is possible," he feels, "to bring sport flying within the reach of the average working man. Flying is not a rich man's sport, particularly with the rapid growth of flying clubs."

The entire Wiggins organization has been geared to meet emergencies. During the recent New England hurricane and floods, each of Wiggins' cabin planes worked overtime to carry stranded persons to and from isolated districts. His pilots flew newspaper and newsreel photographers over devastated areas to record New England's worst catastrophe. onsiderable damage was suffered by the base at Norwood, the hangar and several planes feeling the effect of the hurricane. After surveying the damage to the hangar, Wiggins announced he would not only rebuild it, but would also build another hangar.

Aviation has become a 24-hour job for E. W. Wiggins. When he's not actually on the New England scene developing new ideas and new business, you will find him active in promoting aviation meetings, addressing civic organizations or participating in air tours. Several of the Wiggins' planes flew in the recent three-day air tour of the New England states.

END

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The Ballyhoo Boys

(*Continued from page 68*)

condition to fly as it would be for him to travel by train. One airline official points out in a casual conversation, "If a person is able to walk, he is fit to fly." His line has carried more than a million passengers in the past ten years and only *one* has died in flight—this being a heart failure which medical authorities assert would have occurred had the passenger been traveling on a train or had been elsewhere.

It is no secret that the pilot personnel of some airlines harbor no affectionate feelings for the Ballyhoo Boys. For some time it has been against the "ballyhoo" policy to publicize individual pilots. The pilot has now lost his individuality as far as the newspapers and the public are concerned. Though he has been amassing in these progressive, though obscure years, a wealth of experience in the flying world and he is now one of the world's finest airmen, the pilot is just one gent out of a thousand who fly their ships the way ground officials tell them to—at least as far as publicity outlets are concerned. Individual stewardesses and hostesses are, of course, broadly publicized, but it is a certainty that the pilots can make much better news copy than some attractive, shapely cabin attendant.

There is scarcely any uniform thought amongst the Ballyhoo Boys. Rarely do they convene to swap ideas and problems, except possibly to boycott some honest newspapermen who might have published a story they didn't want published.

One of the greatest weapons wielded by the Ballyhoo Boys was that of the pass. Newspapermen, on assignment or vacation and so on down the line, had been receiving free transportation on airlines for a number of years. Last August that practice stopped with the inception of the Civil Aeronautics Authority. No more passes for holders of publicity possibilities. Most of the airlines are living up to this Federal regulation, although, frankly, one or two of the lines have found a way around it. (Send a self-addressed stamped envelope and we won't tell you.)

Perhaps the most pressing need amongst the Ballyhoo Boys today is to find out what the public wants to know about airline travel. One of the most embarrassing things for the gent who is up in a transport for the first time is "how much shall I tip the stewardess?" The answer is "nothing," of course, but what a fine little gag story the airlines have by telling the air traveling public that they save more than a million dollars a year in tips—for the reason that stewardesses and hostesses are not permitted, by company edict, to accept tips. Many potential air travelers are afraid of the vibration and noise of airline travel. Actually, at cruising levels, a transport is much smoother than any high speed train you've ever been on. Certainly, actual tests would prove that the DC-3 is much quieter than the average railroad car.

It would do the Ballyhoo Boys no end of good if they would look around the country and find out what the public wants to know about them. The writer ran into a man the other afternoon in a New York hotel. No, he didn't fly in the winter. Why? He was afraid of the ice. That's all he knew about it and was frank to admit it. It was just plain "ice" that he feared. How about more stories about de-icing equipment—more stories about the fact that airlines don't operate in severe icing conditions? Those of us who are veteran air travelers are die-hards. We'll probably fly till the end of time. The job at hand is to get those people into airplanes who can use air travel to advantage. That must be done by the Ballyhoo Boys. A whispering campaign can do no good here.

A lot of material which the airlines must convey to the public is, of course, rank advertising—and should be treated as such. Some day, in the not-too-distant future, free space in the newspapers will be at a premium. Then will enter sound public relations, paid advertising. The airlines right now are projecting a joint program with aircraft manufacturers. Could it be that this is the first step in the right direction?

END

Fabric Fuel Tanks

(*Continued from page 32*)

Repairing a metal tank is a costly and generally unsatisfactory process. After the repair has been made, the leak is likely to open again under strain. But the fabric tanks can be repaired as easily as the inner tube and—what's most important—they stand up under pressure just as well after being repaired as they do when new.

And another feature of the fabric container is the fact that it applies a uniformly distributed load instead of a concentrated load to the supports, a matter of importance in many instances. Smaller structural members can be employed with a uniformly distributed load than when this load is carried at a few widely distributed points.

Lining tanks with self-sealing compounds, such as many of the liners used during the World War, have not been entirely satisfactory with any metal tank, let alone tanks of aluminum alloy.

The cells have been so successful in airplanes that the Martin company has just signed a contract which will enable E. I. du Pont de Nemours & Company to manufacture them for use in other industries. The day may be very near when your automobile is fitted with a "cloth bag" instead of a heavy metal tank, but in the meantime your airplane may be a whole lot safer to fly after you've taken out the old tank and put in a Martin fabric container.

END

★

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The First Caterpillars

(*Continued from page 35*)

Then Boettner gave his signal:

"Cast off; up ship."

The *Express* rose rapidly, its two engines purring contentedly in perfect synchronism, as the ship gained rapid headway, lumbering along determinedly at a steady 40 m.p.h. gait. Boettner circled for a time, giving Norton chances to snap long photographic shots, which he expected to use in the Chicago *Herald & Examiner*.

"Say," proposed Norton finally, his words clipping off shortly in the rushing air stream. "Let's try to get some good shots of the Loop. What say?" He poised his camera expectantly on the gondola's edge, now confident and thoroughly at home in the ship.

"Sure," replied the taciturn Boettner shortly, obligingly heading the lumbering rubber cow at about 2,000 feet toward the mid-town area of Chicago, the teaming loop district where bustling thousands were busy with their mid-afternoon tasks. Besides, Boettner was anxious to show off his new giant to Chicago's thousands, the same thousands which had laughed at the plans to build an airship right in Chicago.

To make possible better air shots, Boettner gradually eased back his twin throttles. The ship gradually lost way, wallowing in the gentle wind like a boat in the trough of a lake's waves. Norton focused his camera on the jumbled piles of masonry and steel and the thousands of tiny dots on the streets nearly a half mile below, a slight smile creasing his face as he thought of the envy among other cameramen his air shot of the Loop would cause.

"What a scoop!" he mumbled to himself.

Suddenly the ship lurched drunkenly, staggered as if struck by a giant, invisible hand. A sheet of yellowish, oily flame shot from the gas bag, crackling and roaring omniously. Fascinated, the five men turned their eyes upon the spectacle.

The five stared at the flames, as if in a trance, like mice hypnotized by a snake, unable to move legs or arms. The motors still purred steadily, the ship still rolled gently, but the flames, oily and yellowish, billowed out, singeing their hair.

Static electricity, it was determined later, had fired the highly-inflammable hydrogen gas—just as static electricity, nearly two decades later, fired the greatest of all hydrogen gas inflated airships, the *Hindenburg*.

The first aroused from the stupefied trance was Pilot Boettner.

"Jump," he shouted, madly flailing his arms. "Jump, jump, jump."

His cries aroused the electrified passengers and mechanics.

"Quick, quick," screamed the horrified Wacker, as the flames enveloped the entire gas bag, its greedy fingers clutching ravenously at the suspended gondola.

Split seconds counted now—counted for life.

Norton, the photographer, hesitated a moment, camera poised in hand, swayed between the photographer's inborn injunction, "get the picture," and fear of the flame.

"Quick," gasped Wacker, grasping his arm. Fear won. Norton tumbled over the side.

Davenport, the Davenport who was going to be "scared too stiff," to use his 'chute in an emergency, fought frantically with the tangled parachute lines, determined to sell his life dearly, too busy to be scared stiff.

Wacker followed over side, then Boettner and Weaver. Too late, they realized Davenport's plight, powerless to help him. They saw his agonized white face, staring eyes, as they plunged end over end into space—and continued to see those eyes and that agonized face for days afterward.

Eons and eons later, it seemed—but too soon, it proved—their 'chutes billowed open, suddenly checking their end-over-end falls. Suddenly, the stricken airship was an inferno of oily flames. She shuddered, stopped dead, like a suddenly hit deer, as a minor explosion rocked her, billowing oily smoke and ghastly flame. Then she began her death dive.

The heavy engines, gasoline tanks and gondola frame plumetted downward, tailed by the reluctant, blazing rubberized envelope, throwing off a great shower of sparks and flame and red-hot metal, like a giant meteor.

Gaining speed, the meteor rapidly overhauled the umbrellas, showering them with blazing gasoline. Shuddering, Wacker thought of his wife and their kiddies; thought of Davenport's staring eyes, wondered vaguely if Davenport had kiddies of his own at home.

"God, what a way to die," he muttered, nauseated as he saw Weaver's

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white umbrella, slightly below, suddenly billow into flame, then saw a small black dot—the unfortunate Weaver—plunging end over end at a sickening speed.

Fascinated, Wacker saw a tiny burning spot in his own silken canopy, wondered if his fate would be similar to Weaver's, thought again nauseatingly of Weaver's horrible plunge, of Davenport's agonized face, and pondered the fate of Boettner and Norton.

He saw, far away, the still-blazing wreckage of the unfortunate *Wingfoot Express* strike the roof of one of the brick and steel piles, then disappear through the roof. He wondered, feeling a bit foolish, whether the occupants were surprised with their hellish visitor.

Wacker brushed within a few feet of the roof of one of the tall buildings, on which a crowd was gathered, watching the blazing ship's descent.

He distinctly heard a girl call out tearfully:

"Good luck to you."

Then suddenly all went black as he was dashed into the cornice of another building. He awakened days later, finding that nearly every bone in one side of his body were broken.

And the unfortunate pilot and photographer were having troubles of their own. Norton, within grasp of safety, was dashed against the Western Union building, breaking his legs, then tumbled to the street, unconscious. He died.

Pilot Boettner fared best of all. His 'chute, too, was fired by the blazing wreckage of the hurling meteor that had been the fine, proud airship, the *Wingfoot Express*.

He attempted to land on a tall building's roof, realizing the danger if his 'chute collapsed and he went over the side, missed and came down on the Board of Trade building roof, narrowly missing a glass skylight. His gasoline-drenched chute then burst into flames.

And in the Illinois Savings Bank in La Salle street, blazing hell raged. The bursting gasoline tanks and flaming wreckage, which had come hurling through the sky light, spread death among the bank workers.

The flaming gasoline spread death and destruction, killing many, searing others, destroying the bank's papers and records and property. Altogether, 10 died in the bank. Many others were seriously burned and crippled.

Pilot Boettner, dazed and nursing a burned arm, was arrested on a manslaughter charge—a charge that was dismissed as soon as the wave of hysteria that followed the horrifying dister blew over.

So this year, America's Caterpillars Nos. 1 and 2, Henry Wacker and John A. Boettner, smile a little sadly as they look back over two decades of parachute progress to that summer's afternoon—and the ill-fortunated *Wingfoot Express*.

And do they still want to fly?

"Well, a little—if we've 'chutes along."

Wacker, slim and grayed, today is a WPA clerk; Pilot Boettner still is an active airship pilot.

END

The Case for the Dive Bomber

(*Continued from page 30*)

For months I looked forward to the time when I would be assigned to duty in the monoplanes (known as Moscas). After flying in them for a while, though, I realized that they were pursuit planes—and not combat planes. They had to be handled with the utmost delicacy or they would protest by going off into a violent right spin, which was very embarrassing if it occurred during the progress of a dogfight. We had plenty of speed in them—about 300 m.p.h.—but we had traded maneuverability for it. And the Moscas had to be flown all of the time—whereas we could occasionally get a little rest in the Chatos by letting them fly themselves.

In the war to come that latter fact will probably be of importance. My observations of the casualties in the Spanish War indicate that we may expect to lose about half our regular pilots during the first few weeks of any war we may engage in against a reasonably strong opponent. Then, while replacement pilots are being trained, the remainder of the by-then experienced pilots will have to hold off the enemy

(*Continued on page 81*)

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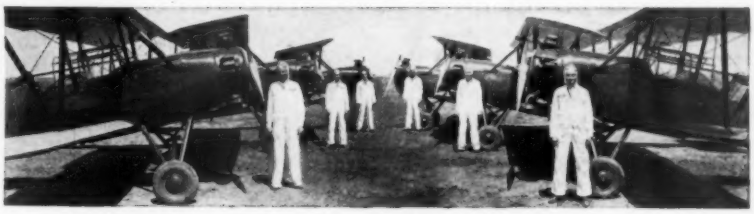

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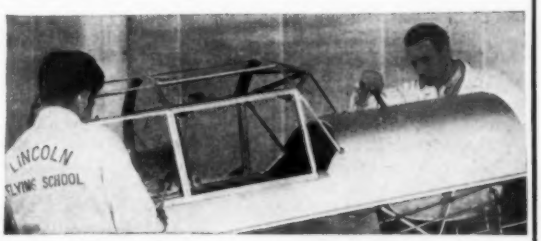

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Speed Is My Hobby

(*Continued from page* 11)

Then again, there is a definite contribution to high altitude operation. In the 1938 Bendix I flew the entire distance at 17,000 feet (Jacqueline Cochran reported she flew her Seversky up from 18,000 to 22,000 feet throughout).

Now, I consider some of the more extravagant talk about the super-stratosphere ships of the near future pretty imaginary, but I do forsee the day when transcontinental passenger schedules will be flown at "over weather" schedules of from 15,000 to 25,000 feet, with the storms of lower altitudes avoided.

The type of high altitude flying in the Bendix races is bound to add to our knowledge of maintaining constant engine horsepower in rarified air and lead to further development of supercharged motors for that kind of work in order to get the benefit of higher speeds at higher altitudes.

Another thing this high altitude stuff has brought to the fore is really efficient oxygen apparatus—and believe me you need oxygen up there. In the 1938 race I used an oxygen outfit invented by Dr. Randolph Lovelace of the Mayo Clinic that was really marvelous. It consists of a mask covering the nose and chin but leaving the mouth clear for radio communication. Because all oxygen is taken through the nose, much less is required and the burning, gagging sensation familiar to pilots who have used the old type of equipment in which you fly around with a little rubber hose in your mouth, sucking in oxygen as you need it, is eliminated.

The Lovelace apparatus, incidentally, has tremendous possibilities in other directions. Dr. Lovelace believes, for instance, that it may to a considerable extent replace the oxygen tents used in hospitals. And after considerable correspondence on the subject we both are convinced that the use of this type of lightweight oxygen equipment may make it possible for men finally to scale Mt. Everest. Many expeditions have climbed high on the sides of that 29,000 foot peak but inevitably they have failed to reach the top, largely because of lack of oxygen. The equipment which they carried was too heavy and too inefficient. But now, with the Lovelace apparatus and with new light tanks such as developed by the U. S. Navy (which weigh only four pounds as against the 20-pound tanks I carry in my plane) it ought to be possible for the strongest men of an expedition to reach the top of the world's highest mountain.

All of which has little connection with cross-country racing, but is mighty interesting just the same.

The other day someone asked me just how I felt when I'm racing against time for a new record—what my reactions have been during the two Bendix races in which I've competed. That's not an easy question to answer, for once the race is over, it is difficult to go back and try to analyze what was going on inside your head while you were in the air. Aren't you terribly tired at the end of a cross-country race? Yes, I suppose you are tired, to a certain extent. I know I was at the end of the 1937 race, for the pilot's meeting at Los Angeles that year lasted until 11 p.m. and I was up at 3 o'clock the next morning and off the ground an hour later.

"My circulation must be getting bad—my wings start icing up at 200 feet . . ."

But it took me only 9½ hours to fly from Los Angeles to New York, which can't be compared with the gruelling 33 hours Colonel Lindbergh spent aloft on his Atlantic flight, or Douglas Corrigan's 28 hours in the air.

There are two other factors, apparent opposites, which help stave off that tired feeling. One is the fact that a pilot learns to relax in the air whenever possible. The other is the exhilaration which attends any race, on land, on the water or in the air.

If it weren't for the exhilaration, certain phases of cross-country racing, when everything is going according to schedule, might almost be termed dull. You just sit there, watching your instruments, listening for radio signals and peering out over the side for landmarks, if you are doing contact flying. And seldom, if ever, do you see anything else in the air.

I can remember my surprise, during the 1938 race, when I caught sight of a plane a thousand feet below me just after I had crossed the Mississippi River. I knew the other plane was too high for an ordinary flight so I dropped down for a closer look. It was Paul Mantz of Hollywood in his shiny Lockheed *Orion*. He waggle his wings at me as I passed him. So far as I know, that's the first time in the history of the Bendix races that two contestants have sighted each other in the air.

But the routine part of racing can vanish like magic when trouble rears its head. There are anxious moments on the take-off with a heavy load of gasoline—the split seconds before your wheels get off the ground when you wonder whether you're going to make it. And after that the worry over whether your competitors are having the same luck. I remember in 1938 wondering if Jackie Cochran would be able to get her Seversky off the ground without trouble. Determined to make Cleveland non-stop she'd added gas tanks to her ship until they extended to the very wing tips—and the job of hauling 541 gallons of gas into the air had some real hazards connected with it, particularly at night. But those who saw it tell me Jackie made a beautiful take-off. She deserves a great deal of credit for getting her ship off with such a heavy load of fuel.

Bad weather complicates matters and keeps the race from growing monotonous. There were plenty of weather problems in the 1938 race. We ran into the tail end of a hurricane that blanketed things from Winslow, Arizona, to the Mississippi. After looking at the weather maps I decided to follow the airway to Albuquerque. I topped the bad weather at 17,000 feet and flew on instruments into Wichita. But the boys who decided to pass up the airway and fly straight over had to climb to 25,000 feet to get out of the mess.

To complicate matters the radio range was out at Wichita, a fact everyone neglected telling the pilots before the race started. Wichita had a ceiling of 1,000 feet, with overcast up to 16,000 feet and I don't mind saying it was pretty difficult finding a hole in that 15,000 foot layer of grief. But incidents like that go into making cross-country racing interesting.

Yes, the Seversky and I expect to be in the 1939 Bendix race in September. I have some new ideas about flying it, too. But whether they're any good or not is a question that can best be answered after the race.

One way or another, I'll be satisfied with the outcome. Simply because I'll again have an opportunity to do the kind of flying I like best—long cross-country racing. Personally, I prefer that kind of racing to any other. So I'm looking forward to this summer's race.

END

Dive Bomber

(*Continued from page 79*)

planes. Every little bit of extra rest those remaining pilots can get will be of inestimable value to them.

That was what was expected of the Russian and American pilots in Spain. We merely held off the German and Italian pilots while the Government was busy training new pilots. Then, after the new pilots arrived at the front, we had the additional duty of initiating them into the routine of front line flying. This was accomplished by leading them over known enemy anti-aircraft emplacements or into dogfights with reasonable numbers of Fiats. Anti-aircraft fire is so ridiculously inefficient that we had no compunctions at all about leading our charges down to as low as a thousand feet above the guns. The first two or three times are the worst for new pilots. After that they are all right and pay no attention to it.

The dogfights were a little more ticklish. We could never be absolutely sure that we had seen all of the enemy planes. On one occasion I led two new men in against what I believed to be only four Fiats and then discovered that there were eight or ten of them far up above. Fortunately, they were so timid that we were able to scramble back into the clouds before they worked up enough courage to come down and investigate. Mussolini's pilots certainly didn't have much heart for their work in Spain. They seem to have done much better over in Ethiopia.

We didn't lead any new pilots in against the Heinkels, though, if we could help it. The German pilots were the best trained and most capable pilots I saw in Spain. It was very fortunate for us that they didn't have the equipment that the Italians had. Their Heinkel fighters were too heavy and had too much "ersatz" (imitation) material in them. They were about as maneuverable as a hearse. The only thing we envied them was their guns and ammunition. Their machine guns and tracer bullets were the best in use on either side. Their tracers left a stream of blobby smoke which could be seen for a couple of minutes after the passage of the bullet. Our own tracer could only be seen on the bullets so that we had to fire a relatively large number of shots to get the same results that the Germans got by firing two or three. The shortage of metal in Germany is shown by the fact that their machine gun belts come out of the guns intact and are conserved for future use. Our own shells and links were ejected from the plane as soon as they passed through the gun. I have a section of German machine gun belt on the table now which shows the ingenuity of the arrangement.

However, we had another great advantage over the German pilots. We knew almost exactly, by experience, what they were going to do when they went into action. They had been, you might say, almost too well trained and couldn't seem to get out of the groove. We knew what formations they would be in up above—we knew what formations they would be in when they came down—and we knew what they would do after they came down. The only point in a dogfight that was really dangerous was when the Heinkels were coming down. But even then we knew how to minimize the danger as much as possible. After their entering dive we usually had the situation well in hand, mostly on account of our superior maneuverability.

This fact is best illustrated by the fact that in every dogfight I engaged in, most of our losses occurred at the start of the fight while most of theirs occurred during the remainder of the fight. Respective losses averaged about two to 11 in our favor so you can see that our tactics were rather effective.

But to get back to dive bombing—the Chatos could, as mentioned before, have stood a lot of improvement. For instance, after we were well into our bombing dives it took quite a bit of strength to hold the planes on the target. They were adjusted for straight and level flight and when they picked up all of that extra speed they tended to pull out of dives of their own accord. Some sort of easily handled equalizer would seem to be the ideal solution.

Even if dive bombers did no material damage at all they would still be of value on account of the psychological effect they have on enemy ground troops. When troops can see the source of the bombs, hear the sound of machine guns and motors all intermingled with the shrieking of wind through struts, they are much more impressed than they are by bombs which come from heavy bombers so high as to be almost invisible.

In his present rearmament program Uncle Sam might do well to do a little experimenting with dive-bombing fighters. A squadron of dive bombers—properly led—could clear the topsides of any division of warships in our Navy.

In closing I might say that the general improvements desired in dive bombing fighters are:

1. A larger engine, for regaining altitude more quickly and for greater protection from ground fire.
2. A better aiming sight for improved accuracy.
3. Improved bomb releases for safety (several pilots blew themselves up over there when bombs failed to fall clear until the planes returned and were landing at their home fields).
4. More and better machine guns, both for improved ground strafing and improved combat work.
5. Some sort of quick acting stabilizer adjustment to compensate for the extra speed picked up in the bombing dives.

Of course, there are many other little improvements which could be made but I believe that the above are the most important.

END

Flying Marines

(*Continued from page 23*)

with his plane and evacuated the wounded men to safety. He was later awarded the Congressional Medal of Honor for his daring feats.

While at times the experiences in the above-mentioned countries absorbed nearly all of the Marine Corps' aviators, they were still able to continue the development of a well-rounded aviation force designed to support the Marine Corps in a major war. By 1927 the Corps had five aviation squadrons at Quantico and three at San Diego in addition to the four then serving outside the United States. Between 1932 and 1934 Marine Corps squadrons were assigned to the *U.S.S. Lexington* and to the *U.S.S. Saratoga.*

Practically ever since Cunningham began flying in 1912, Marine Corps aviation had been going through the developing or pioneering stages with the attendant risk and danger. A considerable portion of both officers and enlisted men who engaged in actual flying lost their lives during this developing stage. The hazards of flying, particularly over the jungles of tropical countries, were far greater than those in commercial aviation at that time. More recent developments in airplane construction plus the advantages of years of experience have of course made Marine Corps aviation considerably less hazardous. With the coming of the Fleet Marine Force in 1933 practically all of Marine Corps aviation was assigned to that part of the Marine Corps.

Although the Army Air Corps and Naval airmen have received immeasureably more publicity and attention for their deeds, the Marine flyers probably have a far more colorful and hard-living reputation than both the major services combined. This is due, of course, to the Marines' varied and widely separated assignments that range through every conceivable duty to which an airplane can be put.

The present authorized strength of the Marine Corps aviation is: 112 airplanes of modern standard navy types, exclusive of spare, experimental, training and obsolete machines. It has in all nine squadrons, seven of which are maintained for tactical purposes and two for general utility. The tactical organizations consist of two fighting, two bombing and three scouting squadrons. The utility squadrons are equipped with transports, amphibious and "odd" types of planes. The operating personnel of Marine Corps aviation consists of approximately 175 officers, 40 flying cadets and 1,100 enlisted men. Marine aviators are trained to operate planes from airplane carriers as well as from landing fields and from the water. One Marine scouting squadron is, at this writing, maintaining a regular aviation station at Charlotte Amalie, St. Thomas, Virgin Islands, and serves as the military garrison for those islands.

END

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(Continued from page 19)

dented in Navy history—a non-stop dash from the west to the east coast by a seaplane weighing 28 tons at the take-off and capable of landing only in comparatively large bodies of water.

Weather conditions at the take-off were anything but encouraging. There was hardly a whisper of headwind to help lift our plane, which was settled deeply in the harbor waters as result of its overload. The bay itself was almost smooth as glass as we pointed the prow down the take-off channel, gave the Pratt & Whitney engines the gun, and roared through spindrift hoping for the best.

As we gathered speed, every one of the ten-man crew realized that this was to be one of the two or three crucial moments of the entire undertaking. Would the bomber, with little help from the outside, be able to safely lift its 56,000 pound load? We were not prepared for its phenomenal performance as we sat tensely at the controls. Within a run of only three-quarters of a mile, the ship freed itself from the powerful suction of the water, leaped into the air, and climbed steadily as we swung toward the east and prepared to vault mountains, cities and dry prairies.

Alternating at the controls were Lieutenants Duerfeldt and Sanders, Chief Test Pilot Bill Wheatley of Consolidated and myself. In the crew were five enlisted men—G. K. Herman, chief radioman; C. R. Roof, aviation machinist's mate first class; Albert H. Geck, aviation machinist's mate first class; J. A. Peters, chief machinist's mate; and F. R. Vanderhoef, radioman first class. R. R. Keith, a civilian engineer, accompanied us as plant representative in an advisory capacity.

At the moment Rear Admiral Blakely innformed me that our destination was to be Anacostia, I conceived this flight as the greatest opportunity yet presented the Navy to demonstrate the possibility of rapid transfer of its giant bombing planes from their present concentration in the Pacific to the east coast, in case of a national emergency.

Hence, I requested permission to fly non-stop to Anacostia instead of via a southern route—admittedly safer for an airboat, since it would skirt the Gulf of Mexico—to Pensacola, Fla., where an overnight stay would be planned.

It was granted and the Naval Air Station aerologist informed us that we might expect favorable winds east from Salt Lake City. We made a beeline for Utah on leaving San Diego. Over Palm Springs and the desert country beyond we flew, grateful for our first sight of water in appreciable quantity when our shadow rippled on Lake Mead, at Boulder Dam. Snow-covered mountains passed in inspiring panorama beneath us as we held to an 11,000-foot altitude, and when we finally sighted the Great Salt Lake, bitter cold had set in.

On that eastward journey, the mercury was to dip as low as 10 degrees below zero, which was more than our heating unit could overcome. The sight of us, wrapped in blankets over our fur-lined suits as we tried to keep from becoming human icicles at the controls, might have been comical if anyone's face could have been thawed out sufficiently for a laugh.

Between Salt Lake City and Laramie, Wyo., we couldn't detect enough water to launch a rowboat, but the engines were revving smoothly, and we didn't dare think of anything so unpleasant as a forced landing. On toward Chicago we flew, passing north of Omaha, North Platte and Davenport, Iowa. From a distance of 100 miles, the brilliant night panorama of Chicago was visible, and there, too, was Lake Michigan, the sight of which was the most welcome east of Lake Mead, many hours behind us.

At Akron, solid overcast enveloped us, and we flew virtually "blind", with Chief Radioman Herman taking bearings constantly on Anacostia, Pensacola and San Diego, the remainder of the route to Anacostia. We circled down through the clouds, eventually noting a landmark that directed us to the good old Potomac River. Then we located the float lights which marked the landing channel in the river, and we set the XPB2Y-1, still purring contentedly, down in the Potomac's muddy waters 12 hours, 50 minutes after taking off from San Diego. We had made the astounding average of approximately 200 m.p.h., and that, for a 28-ton airboat, *is* phenomenal.

That brought us into Anacostia very early Friday morning—at 1 a. m., to be exact. We had delivered the plane at the date set by Rear Admiral Cook, and it was none too soon. Up the ramp through several feet of mud the bomber was pulled on our special beaching apparatus, washed down, and made ready for the President's inspection visit the next day.

The aviation show put on for the chief executive at Anacostia Naval Air Station and Bolling Field was a display of the nation's speediest and most powerful aerial defenders. The Army Air Corps trotted out every one of its advanced planes from the *Flying Fortress* down, and the Navy exhibited its experimental Brewster and Grumann fighters, Douglas "folding wing" torpedo planes, Curtiss dive bombers, and Vought scout bombers, among others. Up from Coco Solo had been flown, also non-stop, two of the twin-engined PBY's which have made the remarkable mass flights to the Canal and Pearl Harbor in the past two years. And, of course, our own "flying battleships" dwarfed most of the rest.

The President drove under the X-job's huge wings in an auto containing Assistant Secretary of War Louis Johnson, Assistant Secretary of the Navy Charles Edison, and Commander John Dale Price, commandant of the Anacostia

Naval Air Station. The chief executive evinced keen interest in the airboat, seen on the east coast for the first time. He exhibited a remarkable inside knowledge of aviation, and in a 15-minute conversation with me, asked details of the plane's performance and our trip, which had excited even Washington officialdom.

Mr. Roosevelt inquired as to the necessity for the large hull, asked about its armament, service ceiling, horsepower of the power plane, its lifting capacity, and speed. He asked us to demonstrate the unique pontoons which fold back during flight to become the wing tips and remarked that the engineer who conceived that principle was indeed clever.

After the inspection had been completed, Commander Price told me that Mr. Roosevelt had asked for exact costs on virtually every one of the planes he saw that day. And suddenly the tremendous significance of this exhibit of our armed forces' most up-to-date planes dawned on me. The President, determined to make U. S. air strength respected by the rest of the world, wanted to see for himself how far advanced we were, and about how much money the building of an invincible Army and Navy armada would require. It was then that our own flight, too, took on added importance.

Immediately after the President left, we were met with a rush of Army officials, led by Maj.-Gen. Henry H. Arnold, chief of the Air Corps, eager to get their first glimpse of the plane most comparparable to their Boeing *Flying Fortress.*

On the next day—Sunday—about 20,000 persons from Washington and environs came to Anacostia to see the Navy's new winged giant. The heads of most of the Navy bureaus inspected the ship later, and I'd wager that the first-hand observation of the XPB2Y-1 after its epochal cross-country hop gained many influential converts to the cause of big airboats.

Again concerned over our safety, ranking officers declared it would be advisable to return to San Diego by way of Pensacola in a one-stop flight. Admiral William Leahy, chief of Naval Operations, thought we had risked our lives long enough in flying over the center of the continent. But I was positive that we could make the east-west flight in even faster time than our west-east trip. I felt that the XPB2Y-1, given a break in favorable winds, could complete the trip in 12 hours even, and that would be the clincher on the demonstration of quick transfer of our Navy's seaplanes from one operating area to another.

Admiral Leahy gave me carte blanche to choose whatever route I deemed best, and on the extremely cold morning of November 9, after a little trouble warming up our engines, we began the return trip across country.

But luck was not with us on this flight. We chose a course south of that taken on the first hop, heading from Anacostia to Nashville, Memphis, Oklahoma City, Amarillo, Albuquerque, and on into San Diego. By the time we reached reached Oklahoma City, we realized that the headwinds we were bucking would keep our speed below that of the first transcontinental dash. At Amarillo, we were biting into a 50-mile gale, and for an hour or so we negotiated only about 100 miles. Thus we concentrated on bringing the big airboat to her home base safely and forgot about breaking records. At 7 p.m., we landed in San Diego harbor, 15 hours out of Anacostia and at the end of a history-making air trial.

We had finished a routine Navy assignment that told the populous centers of the east they need not fear lack of immediate scouting protection far at sea by airboats normally based almost 3000 miles away, on the opposite shore of the United States. It demonstrated the coordinated efficiency of men and plane in an emergency that at first caught the men without the plane.

Naval traditions and naval agressiveness, backed with adequate equipment, and the real interest of our Chief Executive are real factors in the winning of any war to come. Such factors maintain an unbeatable morale.

And, most important of all, it made a deep impression on the nation's chief executive at the very time a staggering reinforcement of our strength in the air is being contemplated.

END

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Air Queen

(*Continued from page* 58)

finding the smoke a good weapon with which to scare the horses. She owns a cattle ranch in Texas and has often assisted in round-ups by using smoke to signal round-up crews on the ground of the whereabouts of cattle.

Smoke writing is performed at 12,000 feet. It usually is very cold up there at any time of the year, and almost unbearable in winter. Having to consider every ounce of weight, the ship has a manually operated pressure pump for the chemical tanks. It is hard work as she has to do her flying with the left hand, and knees, and work the pumps with the right hand. The hardest thing to remember while she is doing all this she says is to dot the "i's."

At sky writing she has written everything in the air from hosiery ads to love notes. While "smoking" she counts as a musician would to obtain the correct size of the letters she is writing.

She smiles when she thinks of one experience she had while smoking (she does not smoke cigarettes) over a Montana town. The weather was changeable and the sky was covered with high scattered clouds. Most of the people of this community had not seen skywriting, so the sponsors insisted on having the exhibition put on even though Miss King objected and advised against it. There was a crowd of 15,000 persons in the audience waiting to see her write in the sky.

So up she went and wrote SHELL in the largest spot of blue sky that was available. But the changing clouds played their little trick and made visible to the 15,000 persons only four letters. The "S" was covered by a fluffy white cloud, and all they could see from the ground was "HELL."

Miss King owns two ships. At present she has a Stinson and her specially constructed stunt ship. The cabin plane boasts the unusual feature of a front seat which collapses to make a bed, thus transforming the ship into an aerial ambulance. One of its most interesting flights in this capacity was made between Dallas, Texas, and Los Angeles, when its pilot was called upon to rush a desperately ill man to medical treatment available only in the latter city. With her patient strapped to his bed, Miss King bucked a strong headwind all the way and delivered her patient safely 13 hours later to a waiting motor ambulance in the southern California city.

On one occasion Miss King flew from Los Angeles to keep a luncheon date. The weather was good when she left, so she wore only a satin shirt and trousers. She took no money or baggage. A sudden squall came up and she was formed to land in a small meadow in the mountains to escape it. The squall turned into a snow storm. The Sequoia National Park Service rangers found her and took her to their headquarters, giving her food, warmer clothing and lodging. The fury of the storm did not blow itself out until she had to spend eight days as a guest of the rangers.

The young woman is an accomplished seaplane pilot having learned to fly them on Lake Union and Lake Washington in Seattle. She passed her seaplane transport tests under Inspector William Moore at Seattle. She once established a world's record for time, distance, and endurance over Lake Washington of eight hours. It was witnessed by N.A.A. officials, and Department of Commerce representatives.

She has performed a co-featured act on many featured air shows with top-rank performers such as Milo Burcham (who has now dropped air show aerobatics to be a Lockheed test pilot), Frank Clarke and Tex Rankin. Miss King has produced and managed air shows, and tours, and has own organization for this purpose.

She has done test work on new types of propellors. Hunting is her favorite sport. When she goes on a hunting trip she does so by plane, often landing in meadows in mountains as near to her destination as possible. Her fishing trips are also made by plane. She is an expert shot and fisherwoman.

Quite as unique as her accomplishments in this field is the fact that Miss King regards her flying as any businessman would regard his business. She set out with determination to make it pay and it has—and then some. Her financial success, second only to the fame she has deservedly won, she traces to hard work, perseverance, and a combination of the same attributes that keep any ground-run enterprise solvent.

She holds land and seaplane commercial licenses, an instructor's rating, and is a third-class radio operator. Her only fraternal affiliation is with the National Aeronautic Association. Wherever there is a safety aviation meeting on the Pacific oast she figures prominently in it.

Admitting that the path has not been easy, Miss King nevertheless finds herself in the enviable position of having proved that women can succeed in a field which is practically closed to them —and which is even hard for men to conquer, for there are but six men in the United States who do the same kind of work she does.

END

Sky Militiamen

(*Continued from page* 39)

competent cooks, are most often desired for enlistment, but training is given an unskilled man just as willingly, provided he is the right material, and is willing to spend one day or night a week, and two weeks each summer, in the pursuit of this highly interesting and really patriotic hobby, the National Guard Air Service.

END

Ice!

(*Continued from page* 56)

of ice will accumulate just aft of the leading edge of the wings. This ridge certainly does not improve the lift of the wing and if the ice formation is permitted to accumulate for any time you will lose control of the airplane.

When conditions are such that the "remaining water" spreads out over considerable areas before freezing the wing will become covered with a thin layer of clear ice. If the layer does not become too thick you will still be able to control the airplane, although more power will be required to maintain altitude or to climb.

There are three ways in which the "remaining water" may be cooled to the freezing point and the actual transformation from ice-water to solid ice may be accomplished by any combination of these methods:

(1) The "remaining water" may be converted to ice by contact with the freezing airstream itself (just like your nose and cheeks would freeze in a freezing wind).

(2) The droplet may be frozen by contact with the cold airplane structure (did you ever sit on a cake of ice?).

(3) Last but not least, the remaining water may be cooled by an interesting process known as "evaporative cooling". Wet the back of your hand—feels cool, eh? Now *blow* on the wet spot; do you get the idea now? It was the *evaporation* of water on your hand which produced cooling at that point. The *rate* of evaporation determines the *degree* of evaporative cooling (blowing on the wet spot makes it feel cooler). Evaporation will also be accelerated in dry air or when the air pressure is decreased. Since the pressure over a wing is less than atmospheric, being least at the point of maximum camber, it can readily be understood why the freezing of "remaining water" occurs faster at this point.

Evaporative cooling is one of the most important factors in causing ultimate freezing of the "remaining water" component of a cloud particle. The laws of physics will show that sufficient cooling will result from the evaporation of only *one gram* of ice water to cause 7.5 grams of the liquid to freeze! Sounds phenomenal, doesn't it? Yet, it was probably this same phenomenon of Nature which resulted directly in the failure of many of the initial attempts at trans-Atlantic flying —believe it or not!

Since clear ice results from the partial freezing on impact (with an airplane) of an undercooled cloud droplet, followed by subsequent spreading and freezing of the remaining water, doesn't it seem logical to conclude that large droplets will be more likely to freeze in this manner than small ones? Actual flying experience has proven this to be the case. Large droplets are found in clouds where the ascending air currents are sufficient to support those droplets. The extreme case of large droplets is encountered in freezing rain. These are simply droplets which grew so large they fell out of the cloud. Freezing rain will always freeze as clear ice—stay out of it.

This rain business leads us to an important fact: *The meteorological conditions which are favorable to the formation or existence of large cloud particles are the same conditions which promote rain, and where these conditions exist at freezing temperatures the formation of clear ice is highly probable.* Stay out of possible rain clouds, particularly when temperatures are between —8 and +2 degrees Centigrade because under these conditions clear ice will form in about four out of five cases.

(1) When clouds tend to form in layers (indicating little convection) the cloud particles will usually be small. At temperatures less than about —8 degrees Centigrade the entire droplet will be likely to freeze after striking the airplane. Under these conditions look for *rime.*

(2) When temperatures are higher than —8 degrees stay out of possible rain clouds. Such clouds have large droplets which will tend to spread after striking the airplane resulting in deposits of *clear ice.*

(3) Don't fly through freezing rain or mist. Go through "on top" or fly around the area of freezing rain.

(4) *Dry* snow will not stick to your airplane.

(5) If it becomes necessary to climb through a "layer of ice" climb at maximum climbing speed (about one and a half times the airplane's landing speed). The longer you are exposed to ice, the more you will pick up. Once ice starts to form, its growth will be accelerated.

(6) Don't trust de-icing equipment (of the expanding boot type) under severe clear icing conditions. At best it is only about 50 per cent effective.

END

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Cannon in the Air

(*Continued from page 64*)

of such size.

One shudders to reflect on what damage half a dozen 23 mm. shells pounded into a Douglas B-18 might do, regardless of the high speed of these American bombers. The only defense against such armament is not speed nor all-metal construction, but guns of high caliber.

The United States has ordered thirteen Bell *Airacuda* pusher fighters. We know they have passed the exacting tests demanded by the Materiel Division at Wright Field. We know they will do something like 300 m.p.h. We know they are all-metal, too, and for that reason would be splendid targets for a gun hurling a large shell. Ammunition of this type thrives on all-metal construction of that sort, but would go through a fabric-and-spruce type wing, doing but little damage compared to its effect against the all-metal airfoil.

We also know that the Bell *Airacuda* is supposed to be equipped with two air cannon but, at this writing, no one seems sure whether such weapons are available in this country. They have been considering the 37 mm. gun manufactured by the American Armament Corporation but, as far as is known, no such guns have as yet been purchased.

This same gun was supposed to have been mounted on the B-17 and the later B-15 but so far has not. The American weapon, which appears to be very efficient under the manufacturer's tests, has not fully convinced American staff officers that it will fill their very exacting demands.

In the meantime, there are no cannon planes available in this country. They can be bought of course, from Madsen and Oerlikon in Europe but, somehow, Americans do not stomach the idea of buying *anything* in the way of military equipment from abroad hence, in the meantime, there are no cannon to mount on fighters, attack ships or giant bombers.

With war most likely in Europe air forces overseas are frenzedly bolting on bigger and better weapons. Only Great Britain seems to ignore the Cult of the Cannon, and possibly for the same reason, as the United States—simply because they have not been able to develop a suitable weapon of their own.

But the Cult of the Cannon will grow. We shall have bigger and better weapons as our fighting ships become greater in span and heavier in weight. It is true, there are no actual facts, borne out by aerial engagements, to substantiate or justify this belief in larger guns, but as the world's navies grew in proportion to the gun-power they were forced to place in their turrets, to overcome the progress made in the development of armor plate; so must the gun-power of airplanes increase to make up for the high speed, and better construction, eventually the abolition of deadly gasoline tanks.

END

Flying Priest

(*Continued from page 48*)

Gabriel Breynat, O.M.I. and Turquetil, O.M.I. Father Schulte immediately went to Canada, setting up headquarters in Montreal—and thus began the most interesting phases of Father Schulte's work.

He has had innumerable adventures and accomplished tremendous good in flying 36,000 miles in two years in the Arctic—and Arctic flying isn't exactly a Sunday school picnic. It takes courage, brains and faith to fly in the Arctic. For "America's ice box" holds all the flying hazards common to other parts of the world, plus a lot of special tricks of its own, and it offers few flying aids.

"The ice box" actually is a pretty tremendous piece of property. Just to give you a general idea, take a cut-out map of northern Canada and spread it across a map of these United States. Then sow a handful of small grain—say, one grain for each inhabitant of a city the size of Springfield, Ohio—across this tremendous map and you will get a pretty good idea of the density of population or lack of it. You count the population in persons, not in millions.

It was Father Schulte's job to range this vast territory, visiting those scattered few. Blinding fog, engulfing blizzards, temperatures often ranging to 50 or 60 degrees below zero, terrific winds that swept unbroken and unhampered across the Arctic plains—those are some of the North's special hazards that hampered.

Besides there are no man-made airports with their gasoline supplies, no repair stations to supply broken or damaged parts in case of accident, no radio ranges or direction-finder stations—and if you go down in a forced landing, well . . .

Arctic planes always carry large supplies of extra equipment for such emergencies—rifles, sleeping bags, stoves for heating oil, oil containers, extra food, plenty of extra gas and extra parts. No, Arctic flying isn't exactly a Sunday school picnic.

But his adventures . . .

For instance, one day came a call from a wireless station at Iglooik, a bitter tiny station 1,200—1,200 of the especially long, cold, bitter Arctic miles—away.

A father of five children was gravely ill, dying of lack of competent medical care. Dr. Thomas Melling, a representative of the Canadian government, was gravely concerned and pondered a way of saving the man's life.

"I wish . . . " Dr. Melling began.

"Well," said Father Schulte, swiftly reading the medical man's mind, "what's to stop us? Let's go."

Father Schulte studied the lowering skies, the blizzard scudding down with a concerned eye.

"But," protested one man to Father Schulte. "Why go? That that isn't a Catholic; neither is Dr. Melling."

Rudely, Father Schulte shoved the protester aside.

"Come on," he said, flatly. "Let's get started. Suffering knows no religious lines. Who are we to decide?"

For the 1,200 miles, they—the hulking 250-pound priest and the Protestant Dr. Melling—flew a mad race with death, flew side by side as man and man, unmindful of religious differences. For life was at stake.

They flew without radio or even complete blind flight instruments; they flew through blinding fog and swirling snow, making forced landings on frozen lakes and rivers where a forced landing, poorly executed, could mean death. They fought 47-m.p.h. winds, and they tore with frozen fingers at an ailing motor. But they saved the dying man's life.

Another time, Father Schulte nearly lost his ship, a Stinson, at Eskimo Point in a 70-m.p.h. gale. The priest had landed on water and found the two 500-pound anchors were insufficient to hold her down in that wind.

"Got to save the ship," he grunted, grimly, throwing off part of his priestly regalia.

Swimming to one of the pontoons, he threw himself across it, adding his 250-pound bulk to the weight of the anchors and held on grimly for two hours. Not exactly becoming to priestly dignity, laying on that pontoon—but extremely effective in saving the ship. And loss of that ship would have proved quite embarrassing it being a long walk home.

Another time, the mission station at Pelley Bay, near the North Pole, was without supplies for three years. Ships were unable to penetrate the ice to reach it. Finally a frantic call was sent to Father Schulte.

"We'll do the job," he replied, calmly. "We'll take them the supplies. We've got the easy job; they've got the hard job. God bless them."

He flew in a ton of supplies—mail from home, eggs, butter, oranges, fresh vegetables, medical supplies, salt and pepper, clothing, the first the suffering missionaries had had in their three years—in six dangerous flights.

Another of his famous rescues was that of the Rev. Julien Cochard, O.M.I., a brother of the Oblate order of which Father Schulte is a member. Came word to Father Schulte that Father Cochard was critically ill at his isolated station at Arctic Bay, 1,100 miles away, and less than 1,000 miles from the North Pole.

Outside a northern blizzard raged, but Father Schulte promptly ordered his airplane engine warmed, and the ship gassed.

"But it is dangerous," protested his aides.

Father Schulte laughed recklessly, the spirit of adventure gleaming, as he climbed into his great fur-lined flying suit and fur overcoat, pulled on his great fur mittens.

"I like danger," he commented. "And, more important, a brother's life is at stake."

He dashed in 15 flying hours to the bedside of the missionary, who could speak only in whispers; loaded him aboard the plane, and flew him another 15 hours to the Catholic hospital at Chesterfield Inlet, covering in 30 hours a total of 2,200 miles—a trip that would have required many months by the ordinary ground travel.

At Chesterfield Inn, he visited the Canadian icebreaker *Nascopie*, and met Bishop Fleming of the Anglican Church aboard the vessel. The two became fast friends.

"I liked Bishop Fleming so much," wrote Father Schulte, later, "that I wished he was a brother priest of mine. As far as religion is concerned, we work differently; so far as charity is concerned, I promise my help.

"I believe that Christ died for everyone's salvation and that we should give all our good will to bring quick relief to anyone in distress."

There have been innumerable other exploits—such as twice guiding ships, in danger of being crushed between ice floes, through the winding dangerous channels of Frozen Strait; such as flying the Very Rev. Father Provincial Gilles Marchand from his mission station at James Bay to Montreal to visit his dying mother; in rushing aid to dying persons; in flying supplies to those in dire need of them. Many have been the sick and suffering that have received this aid.

Father Schulte now has other pilots to assist him in the work in the North, among them Friedl Lang, son of the noted Anton Lang who played Christ in the Passion Play of Oberammergau for many years.

"Why," asks Father Schulte, "do I stay in the North with its dangers and hardships and suffering?

"Ah, because I like the North; because I like men—and I like flying."

END

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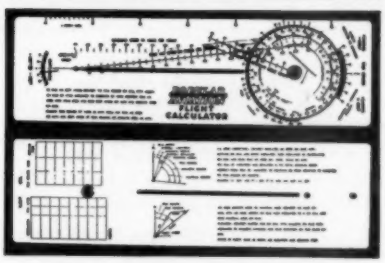

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This special offer becomes effective with the May, 1939 issue. Ads for this issue must be received no later than March 10th. This offer may be withdrawn at any time without notice, so readers are urged to place their ads promptly while this offer is open.

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Airy Chat

(*Continued from page 8*)

thing about aircraft when they are placed in charge of an aircraft unit. We hope that they will appropriate a sufficient fund for a sufficient number of the aircraft engines that were produced and that they will appropriate a sufficient proper men from getting the blue-prints necessary for carrying on the work.

* * *

WE have a grand personnel in our army and navy—that is one thing that we can be thankful for. They are top-notch in intelligence, aggressiveness and loyalty but they cannot do much if red-taped and rubber-stamped out of business. We need not worry about our military organization, nor the technical ability of our engineers, our only worry, and that is really a worry, is the type of men that are to be appointed as civilian heads of the various aircraft divisions—executives yanked in from any industry that can boast an executive.

* * *

I HAVE just finished reading Capt. Duncan's new book on flying instruction which comes as close to getting actual flying experience as any similar book I've read. It is really a "Flying Instructor".

* * *

OUR hats off to President Roosevelt for the interest he has taken in building our air force. Certainly America must have an air force second to none. Anything short of that is neither consistent with our national pride nor with our national defense.

* * *

AS in many legislative efforts—the motive may be sound but the procedure may be faulty. We hope that such will not be the case in this new effort on the part of our President.

Certainly the immediate program of providing 3,000 to 10,000 airplanes for military purposes (actual or potential) must meet with wholehearted endorsement of the aviation industry and the American public. But we must remember that such a program must be carefully planned or it will have a painful aftermath that the aviation industry will be years in overcoming.

* * *

IF our aircraft factories became geared up to mass production of thousands of airplanes for 1939—what's going to happen in 1940 and 1941? We do not want to find ourselves with huge factories, thousands of skilled help lying idle simply because they were set up to handle a peak load. We had some such a sour experience in 1928.

Whatever our military aircraft requirements shall be, they should be met—but with ample provision for consistent production either with normal replacements, allied products, or the opportunity for additional orders in commercial aviation. Failure to contemplate the status of the industry *after* the initial order has been filled, will invite disaster.

* * *

A SIMILAR word of warning can be made in regard to the plan for training 20,000 military pilots. Certainly POPULAR AVIATION endorses this program in the interests of national defense. We did so years ago when we sponsored a huge petition which went before Congress urging Uncle Sam to set up a Civilian Air Corps. Ten thousands new airplanes aren't much good unless we make ample provision for the training of pilots to fly them, and for adequate trained personnel and equipment to handle, store, and service these planes on the ground.

* * *

IN training these 20,000 pilots, the Government must not rest exclusively on *new* material. The thousands of present-day pilots and student pilots (estimated from 25,000 to 50,000) who already *know* how to fly offer very suitable material for military training.

The Government has not yet announced officially where these 20,000 pilots will be trained. Newspaper reports indicate that a giant's share of the appropriation will go to universities and colleges for this purpose. This is not the solution.

These schools and colleges may be practical for theoretical class-room and certain ground work, but with few exceptions are not equipped for flight training. True they could get this equipment, personnel, and experience but at what cost in money, in loss of lives and aircraft!

Far better to allocate training to those sources best equipped. Our present army and navy stations can be expanded readily and effectively.

The civilian flying schools—certainly those who have earned and won government approval—are ideal for training purposes, and under government supervision can readily be made to do a first class job of military training.

* * *

AND so endeth the March "Chat". Be with you next month.—J. B. R.

Air Hotel

(*Continued from page 44*)

(American, Delta and Braniff) stayed there and commuted the several miles to town each day for the convention sessions.

And wherever there are stewardesses—Brownsville, Texas; Glendale, Cal.; Boston, Mass., Seattle, Wash; or Kansas City, Mo., the Hyde Park is well known. Because Chicago, as the aviation center of the United States, also contains the training schools for United and American and it is at the Hyde Park that most of these girls stay before being transferred to other sections of the country.

As well known as the hotel itself are the hotel employees who act as combination confessors, messengers and general clearing houses for aviation gossip and news. Four desk clerks—Ralph King, Howard Backman, H. R. Cox and F. H. Agee—are as well known to most people in aviation as the faces of C. R. Smith, Donald Douglas, Jack Frye or Lindbergh. Well-known, too, are the colored bell boys among them Stan White, Ben Gatewood, Tom Thomas, Dick Dickinson and George Scott. Scott is the doorman; perhaps one of the best known men of his profession in the city. He has served the Hyde Park for the past 20 years and was at another hotel for 30 years prior to that.

To one with imagination the lobby of the Hyde Park is a romantic place. Across the floor, outward bound, stride the crew of an airline—captain, first officer and stewardess. The men, strong jawed with keen eyes; the stewardess, trim and neat in her uniform. What will they see on their next trip? What adventures a thousand miles away will they have? Are they the future Lindberghs, Hughes, Corrigans and Earharts of aviation?

As the Spanish say, "Quien Sabe?"

END

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Miscellaneous. Handling plane having 3-wheel landing gear. Exhibition acrobatics at low altitude: Inverted figure 8. Cuban 8's Nos. 1, 2, 3.

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